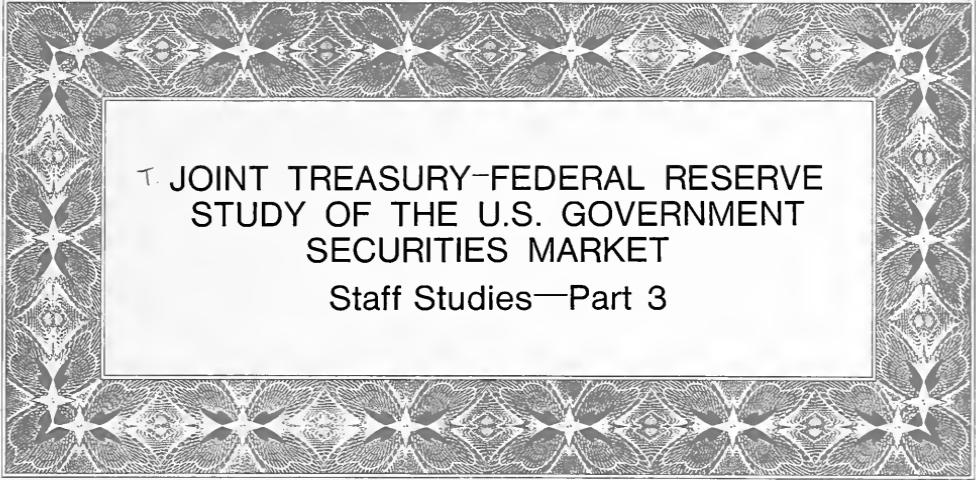


JOINT TREASURY-FEDERAL RESERVE
STUDY OF THE U. S. GOVERNMENT
SECURITIES MARKET

STAFF STUDIES-PART 3

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T. JOINT TREASURY-FEDERAL RESERVE
STUDY OF THE U.S. GOVERNMENT
SECURITIES MARKET
Staff Studies—Part 3

December 1973

NOTE TO READERS

The papers in this pamphlet were prepared as background material for a joint Treasury--Federal Reserve study of the U.S. Government securities market initiated in early 1966 to evaluate how that market was functioning in light of the institutional and public policy changes that had taken place in the first half

of the 1960's. The final REPORT OF THE JOINT TREASURY--FEDERAL RESERVE STUDY OF THE U.S. GOVERNMENT SECURITIES MARKET was published in April 1969.

For the most part the individual papers do not include data or comments concerning the period after mid-1967.

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NEW TECHNIQUES
IN DEBT MANAGEMENT
FROM THE LATE 1950's
THROUGH 1966

Lawrence Banyas
Deputy Assistant to the Secretary
U.S. Treasury Department

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I. INTRODUCTION

As in other fields, new techniques and innovations in Treasury debt management were developed to meet specific needs. Some of these needs were already well established by the late 1950's while others evolved later, but all are related to fundamental and continuing debt management objectives. The basic functions of Treasury debt management are to borrow for expenditures not covered by revenues and to refinance maturing obligations. Of equal importance is the role of debt management in achieving major national policy goals—promotion and maintenance of sound noninflationary growth in the U.S. economy and progress toward balancing our country's international accounts.

A number of subsidiary objectives may also be cited:

To achieve and maintain a well-balanced debt structure;

To provide debt instruments that are designed to meet market and nonmarket requirements;

To minimize the interference of the Treasury's debt management actions with the execution of Federal Reserve monetary policy; and

To hold interest costs to a minimum within a framework consistent with all other goals.

A later addition to these aims has been the coordination of the financings of Federal agencies with those of the Treasury within the context of broad economic policy objectives.

II. HISTORICAL SUMMARY

INNOVATIONS IN TREASURY BILLS

Toward the fall of 1958 the Treasury became increasingly concerned over the lack of receptivity in the market, even to short-term offerings. Faced with the huge increase in the deficit in fiscal year 1959, the Treasury felt that much of it, out of necessity, would have to be financed in the money market area of Treasury bills. At that time, only 91-day bills were being issued except for the seasonal tax-anticipation bills. In expanding the amount offered each week to increase the total volume of the 91-day bills outstanding, the Treasury would have run the risk of not having the offering adequately covered by subscriptions. Instead, by lengthening the maturity of the bills, the same amount offered each week would be able to support a proportional increase in the volume outstanding. For example, \$1 billion of 13-week bills offered each week would keep \$13 billion outstanding and \$1 billion of 26-week bills could maintain \$26 billion outstanding, and so forth. Conversely, it would need only \$1/2 billion of 26-week bills to maintain \$13 billion outstanding. Accordingly, these considerations led to the introduction of the

6-month bill in December 1958. The 26-week bill was not intended as a substitute for the 13-week bill. While the weekly offerings of shorter bills were reduced, they were continued for those investors preferring the most liquid Treasury borrowing instrument.

Developing a full cycle of 6-month bills while cutting back on 3-month offerings was a relatively slow process in a period of pressing and immediate needs. Thus, the quarterly 1-year bill cycle involving amounts of \$2 billion in each issuance was introduced in the spring of 1959 to fill that gap. In order to interfere as little as possible with certificates generally offered in the quarterly refinancings at the midpoints of February, May, August, and November, the 1-year bills were designed to mature at midmonth in January, April, July, and October.

During the period through 1959, the currencies of most industrialized countries of the free world had become convertible or fixed in terms of gold and/or dollars. Due to increases in the U.S. balance of payments deficit the Treasury lost gold steadily and increasingly. The rising excess of outgo over income resulted mainly

from U.S. military commitments, foreign aid, tourism, export of capital, and more particularly, from the lure of higher interest rates abroad following currency convertibility. To discourage the flight of short-term funds seeking higher rates overseas after the onset of the 1960-61 recession, bill rates were prevented from declining to the low levels that had been reached during earlier postwar recessions.

In 1961 the procedure familiarly called "operation twist" was undertaken jointly by the Federal Reserve System and the Treasury. The System's role was to divert part of its open market operations for monetary expansion into the coupon issue area, including maturities over 1 year. By so doing, the System would be helping to hold long-term interest rates down to spur the domestic economy, while refraining from putting downward pressure on short-term rates. Debt management's part in the process was to increase the supply of bills: first, in the conventional way by increasing offerings of regular bills; and second, by offering bill strips from time to time. These strips consisted of a simultaneous addition to a number of consecutive weekly maturities of existing bills. The announcements stipulated that tenders had to include, in one bid, equal amounts of each maturity offered in the strip. The complicated nature of the bidding for the strips tended to discourage all but the most sophisticated bidders. As a result, bill rates probably rose more rapidly than they would have through the more gradual system of increments to a whole cycle of regular bill offerings.

In the meantime the quarterly 1-year bill had not been enthusiastically received by the market, and its performance during the next several years was relatively spotty. To diminish the impact of such bills on the market, the Treasury reached the decision in 1963 to reduce substantially the amounts in each offering, but to increase the frequency of the offerings.

Accordingly, the quarterly cycle of 1-year bills was converted into a monthly cycle beginning in August 1963. Although the amounts offered were cut back by about 60 per cent, the greater frequency of offerings in the con-

version permitted an appreciable over-all increase in the amount of 1-year bills outstanding on the completion of the cycle.

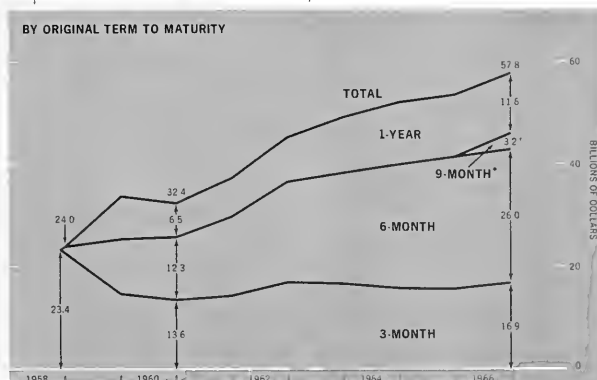
The initiation of the month-end annual bill had an important effect on Treasury debt management choices and decisions in the short-term coupon issue area. These bills virtually replaced the 1-year certificate, which had been the basic "anchor" issue in the quarterly refinancings. Instead, except for one offering of certificates in August 1966 the Treasury has issued short-term notes of 15 to 21 months' maturity. In addition, the pricing of these short-term notes has been strongly influenced by the results of the 1-year bill auctions immediately preceding a financing.

In early September 1966, following announcements that Federal borrowing from the public, including agency borrowing, would be cut back and that sales of participation certificates (PC's) would be postponed until the credit markets improved, the Treasury embarked upon a new month-end cycle of 9-month bills to raise part of its current cash needs. At the same time the 1-year segment of the monthly cycle was reduced slightly. Including the strip of three 9-month bills offered in November 1966, only two monthly issues remained by the end of the year, to complete the 9-month cycle.

Chart 1 shows the composition of outstanding bills by original term to maturity. In early December 1958, just before the inception of the 6-month bill, regularly issued 3-month bills totaled \$23.4 billion. By the end of 1966 the regular weekly and monthly bills outstanding amounted to \$57.8 billion—an increase of \$34.4 billion. Of the \$57.8 billion total, \$16.9 billion or 29 per cent were originally issued as 3-month bills, \$26.0 billion or 45 per cent were 6-month bills, and the combined 9-month and 1-year bills were \$14.8 billion or 26 per cent.

By and large the 2½-fold expansion of regularly issued bills occurred without straining the absorptive capacity of the market, and the added choices of maturities played a significant role in the orderly distribution of the expanded volume.

1 | GROWTH OF REGULARLY ISSUED TREASURY BILLS, November 1958 - December 31, 1966



* Includes \$1.2 billion strip of 4-, 5-, and 6-month bills issued in November.

† Includes \$0.4 billion dated Dec. 31, 1966, delivered Jan. 3, 1967.

NOTE.—Data are for end of year except that in 1958 a figure for November 30 is also shown. Based on data from U.S. Treasury Dept.

ISSUANCE OF COUPON SECURITIES AT A DISCOUNT

In 1958 the Treasury actively explored the question of issuing coupon securities at a discount. At that time the General Counsel of the Treasury held that public debt legislation enacted soon after U.S. entry into World War II had overridden an earlier provision against offering a security at less than par. Also in 1958 the Attorney General rendered an opinion in concurrence with the Treasury General Counsel which stated that it was clearly the intent of Congress to give the Secretary of the Treasury greater flexibility in the issuance of U.S. obligations. Accordingly, the Treasury began to offer coupon issues at a discount late in 1958. Although reasonably certain that it had legal sanction for such issuances, stemming from the wartime legislation, the Treasury did not exercise the option until 1958, mainly because it was felt that below-par offerings would not be favorably received by the market.

The principal advantage of discounting coupon issues is that it enables the Treasury to "fine tune" the yields on its offerings to make them more attractive. Equally close pricing

could, of course, be accomplished by providing the next higher coupon rate at a premium. This had been done on a number of occasions over the years. In practice, however, it had been found that investors were generally loath to pay above par for a closely priced offering in a somewhat cautious market environment.

One advantage to the investor of offering issues below par is that the discount can usually be treated as a capital gain if the issue is held to maturity. Moreover, the discount price can be treated as the cost basis for determining a gain (or loss) if the issue is sold before maturity. This is of no advantage to nontaxable investors and is not a very important advantage to taxable holders ordinarily, because there are definite limits to the allowable amount of discount at original issue, which would be permitted capital gain treatment. Section 1232 of the 1954 Internal Revenue Code spells out this limitation, as follows:

"If the original issue discount is less than $\frac{1}{4}$ of 1% of the redemption price at maturity, multiplied by the number of complete years to maturity, then the issue discount shall be considered to be zero."

However, if the discount at original issue is

$\frac{1}{4}$ per cent or more of the maturity value for each full year to maturity, the discount is treated as ordinary income. For example, if a 2-year note held to maturity is issued at a price of 99.50, the 0.50 discount would be treated as ordinary income for tax purposes, but at a price of, say, 99.51, the 0.49 discount would be treated as capital gain.

According to the tax code, under original-issue discount (that is, the 99.50 example above), any gain on subsequent sale—up to the pro rata amount of the discount based on how long the issue has been held—would be considered ordinary income. Suppose that in the first example above, where a 2-year note was issued at 99.50, the original investor sells the note for 99.75 at the end of 1 year. The pro rata part of the discount for the time he has held the note is 0.25, or one-half of the issue discount. Since his gain is 0.25, all of it is ordinary income. If the gain were less, all of it would still be ordinary income, but if it were more, the excess over 0.25 would be a capital gain. If the second buyer then holds the note to maturity and redeems it at 100 (face value), the pro rata share of the discount for the second year would also be 0.25, and the second investor's gain would also be all ordinary income.

The problems stemming from an original-issue-discount obligation relate to trading in the secondary market, in which case the pro-rata of the discount must be continued. For odd periods of holdings and at varying purchase prices, this could create numerous problems.

In this connection, an anomalous situation developed with an issue of Treasury notes in 1964. In the regular quarterly refunding in February of that year, the anchor issue offered by the Treasury was an 18-month, 3 $\frac{1}{8}$ per cent note at a discount price of 99 $\frac{7}{8}$. Since the discount was less than $\frac{1}{4}$ per cent of the par redemption price at maturity, it was not considered original-issue-discount for tax purposes. During the following April, the Treasury reopened the 3 $\frac{1}{8}$ per cent note to raise needed cash, but this time the price was 99.70

because the market had softened. The 0.30 discount in this case, however, was original-issue-discount, and therefore the additional issue of 3 $\frac{1}{8}$'s could not be regarded as truly identical to the February issue in the market. In order to differentiate between the two, the additional issue had to be stamped, and during the remaining term to maturity the market had to provide separate quotations for each part.

However, the right to issue certificates, notes, and bonds at a discount has served the Treasury well. Within the limitation precluding original-issue-discount treatment for tax purposes, it was found desirable to issue securities at a discount on many occasions. Since the practice was introduced in 1958, discount issuances through 1966 totaled about \$97 billion of coupon obligations for cash or in exchange for maturing securities.

CASH REFUNDING

In the fall of 1958 and throughout 1959 the Treasury also experienced a substantial rise in the proportion of maturing issues that public holders turned in for cash, instead of accepting attractively priced exchange offers. This, of course, is a natural consequence of a rising interest-rate environment, in which investors believe that alternative instruments are more remunerative or that the offered issues may subsequently be obtained at lower cost in the market.

In either case, the Treasury was faced with an increasing volume of attrition at a time when, in addition to massive refunding requirements, large amounts of new funds were needed. To meet this development, the Treasury announced in March 1960 that holders of succeeding maturities would not necessarily have the preemptive right to an exchange offer. Instead, the Treasury at its discretion would pay off maturing issues with funds obtained by offering an approximately similar amount of new securities for cash subscription.

One of the problems that arose from the use of the cash refunding technique was related to the rollover of maturing issues held by official

accounts. In a rights refunding, when a coupon issue matures, the Federal Reserve and the Government Investment Accounts generally roll over their holdings into the new securities offered, while other investors subscribe for as many of the new issues as they wish. In the case of new cash financings the Federal Reserve does not participate at all while the Government Accounts have usually been allotted a predetermined amount in full, generally \$100 million or less. All other investors are subject to percentage allotment except for minor amounts to small subscribers (small subscriptions) allotted in full.

In those instances that involve cash refundings the Treasury had to find a way to accord the same treatment to the holdings of the Federal Reserve and Treasury Accounts as in rights refundings; otherwise their subscriptions would be subject to percentage allotment as would those of all other subscribers. In that event, the Federal Reserve and Treasury (for the Government Investment Accounts) would have to guess the correct percentage allotment, or else these official investors would acquire either more or less of the new securities than their holdings of the maturing issues. In either case, but mainly with respect to the Federal Reserve's allotment, there would be an unwanted effect on the money market of unpredictable extent: toward ease if more were acquired than held, or toward restraint if less were acquired.

The problem was resolved by allowing all investors to turn in their maturing securities to pay for the new issues, and by including in one category all official-type holders or accounts whose subscriptions would be allotted in full. These accounts, as listed in the first cash refinancing announcement of the August 1960 maturities, include: States and their political subdivisions and the instrumentalities thereof, public pension and retirement and other public funds, Government Investment Accounts, the Federal Reserve Banks, international organizations in which the United States holds membership, foreign central banks, and foreign states.

Beginning with the November 1963 cash refunding, the Treasury announced that subscribers entitled to full allotment would be required to certify that the amounts of their subscriptions do not exceed the amounts of their holdings of eligible securities immediately prior to the announcement. The stipulation is intended to prevent any of the listed holders from buying up the eligible issues after the announcement to acquire a larger amount of an attractively priced offering, possibly for speculative purposes.

As in offerings for new cash, other factors in cash refundings such as maximum allowable subscriptions, cash deposits, allotment ratios, and minimum allotments have been varied to suit particular conditions.

The cash refinancing procedure has a number of advantages over rights refundings. In a cash operation the Treasury determines how much of one or more issues it wants to offer. Thus, the technique offers flexibility in that additional cash can be raised by offering more than the total amount maturing, or if attrition is desired, the exact extent of it can be predetermined. By the same token, unwanted attrition, which may occur in a rights refunding, can be avoided. In addition, with more flexible control over subscriptions and allotments, excessive speculative activity can be more easily held within bounds.

However, there are two principal advantages of rights over cash refundings. First, an investor knows exactly how much of a new issue he will be allotted in a rights operation. This is preferred by the relatively smaller, less sophisticated investor who would have to guess the allotment ratio in a cash refunding and pad his subscription accordingly. If the guesses on allotment ratios are too small, investors may have to accept more of the new securities than they had wanted. Hence, smaller banks and other institutional investors are ordinarily more inclined to participate in rights refundings than in cash operations.

The second basic advantage of using rights is that the market rather than the Treasury determines the amount taken of each issue when

two or more options are provided. When the Treasury sets the amounts of each issue offered in a cash refunding, there is some tendency to limit the size of the longer option for fear that it will not be adequately covered. For that reason longer options may be made arbitrarily small, or may be eliminated entirely. Thus, rights refundings tend to maximize debt extension.

The Treasury made extensive use of the cash refunding technique from its inception in August 1960 through November 1966. During that period there were 26 quarterly refinancings. Of these, 10 were cash operations.

ADVANCE REFUNDING

In early 1959, when the rapid economic expansion that had started in the spring of 1958 was in full swing, the Treasury became increasingly convinced that alternative methods of debt extension to bring about a better balance in the maturity structure of the marketable debt would have to be explored. Strenuous and fairly successful efforts had been made to lengthen the debt in the period between September 1957 and January 1959, but the inexorable passage of time rendered the success quite temporary. In the ensuing period of rapid upturn in market rates of interest, the normal methods of debt extension through cash offerings or refundings at maturity were strongly felt to be inadequate and costly if, indeed, they were possible at all.

In the normal course of events, as longer-term issues shortened, they gravitated into the hands of intermediate- and short-term holders, mainly commercial banks and corporations. Finally, when the issues matured, holders of short-term issues were not inclined to accept long-term bonds in exchange; thus in rights refundings—the usual type of operation up to that time—a reverse transfer of maturing issues to long-term investors became necessary. Except in a period of falling interest rates, there was little chance for substantial amounts of long-term offerings to be taken. The method decided upon as promising truly significant

amounts of debt extension, with a minimum impact on prevailing longer-term rates, was advance refunding. In an advance refunding the Treasury offers holders of existing issues, which are not due to mature for some time, the opportunity to exchange their holdings for longer issues.

In the summer of 1959, legislation was introduced to modify the tax code sufficiently to ease and simplify advance refunding operations for many investors who would otherwise be unwilling to exchange. The legislation provided for nontaxable exchanges in advance refundings, when so stipulated by the Secretary of the Treasury. Accordingly, in most cases investors could carry over the cost basis of their issues eligible for exchange to the new issues offered. Generally, Federal and State supervisory authorities followed the Treasury's lead in allowing such accounting treatment, and under the provision many institutional investors, including those not subject to tax, could take advantage of the exchange offer without having to show a substantial book loss on the old issues being replaced. In essence, the nontaxable exchange provision postponed the recognition of any gain (or loss) until the new securities were subsequently sold or redeemed.

The new legislation also removed another impediment to successful advance refunding operations. It provided that the issue price of the old security would become the issue price of the new, which precluded treating the new issue as having been offered at an original-issue discount for tax purposes. In many cases, without the new provision any subsequent profit on the sale of the new securities would have been converted from a capital gain into ordinary income.

After the groundwork had been completed, the Treasury tried a pilot advance refunding in June 1960. The operation was considered a success, and it led to the full-scale advance refunding of October 1960. In September 1960 the Treasury issued a white paper, *Debt Management and Advance Refunding*, in which basic concepts were discussed. The paper indi-

cated that "senior" advance refundings, such as the October 1960 operation, should involve outstanding issues maturing between 5 and 12 years whose holders would be offered long-term bonds with terms of 15 years or more. "Junior" advance refundings, such as the June 1960 operation, would involve outstanding issues maturing between 1 and 5 years whose holders would be offered medium-term issues in the 5- to 10-year maturity range. Thus, the longer outstanding issues in a senior refunding would be replaced by the new issues offered in a junior refunding, leaving the 1- to 5-year area open to regular refundings of maturing issues and cash offerings. It was felt that in this leapfrog process the ownership pattern of the outstanding issues would remain relatively undisturbed, market churning would be reduced, and the upward pressure on longer-term interest rates would be much smaller than with similar-term conventional refundings at maturity.

In addition, since advance refundings are not subject to any predetermined schedule, the Treasury can choose the most opportune time for such operations in relation to the market environment and to other debt management objectives. Moreover, unlike refunding at maturity, attrition is no problem because there is no expectation that nearly all of the publicly held portion of an eligible issue will be exchanged and no cash payoff of the remainder is involved. Thus, the Treasury runs little risk, and any appreciable amount extended not only improves the debt structure but also reduces the refunding burden when the issue finally matures.

While the precepts regarding the leapfrog principle generally continued to be observed, the role of advance refunding was gradually expanded beginning in 1962. First, junior- and senior-type offerings were included within one operation. Second, the mechanics of advance refunding were applied to outstanding issues maturing within 1 year, with the objective of reducing large concentrations of early maturities to facilitate regular refinancing when they finally came due, and later such short-term is-

suues were included with junior advance refundings. Third, outstanding issues maturing in 5 years or less were made eligible for exchange into long-term issues. And fourth, the scope of advance refundings was greatly enlarged in terms of the number of eligible issues in one operation and the amounts of these issues in public hands.

Advance refunding into long-term issues was effectively prohibited when market yields rose above the 4¼ per cent interest limitation on bonds in the fall of 1965. In 1966 the technique was combined with regular refundings and limited to the advance refunding of issues maturing within 6 months into notes coming due within 5 years.

Even a brief history of advance refunding would be incomplete without including a description of its evolution into a formidable debt restructuring tool through conceptual changes and the development of subsidiary techniques.

At first the choice of outstanding and offered issues was limited, by and large, to those that could be accommodated on a straight par-for-par basis. It was held by some that any adjustment payments to, or by, the subscriber would complicate the operation beyond the chance of success. However, such adjustment (or "boot") payments were successfully introduced in the third advance refunding. Thereafter, boot payments made possible a much wider choice of eligible and offered issues and, in fact, led to advance refundings in which as many as nine eligible issues were exchangeable for any of three offered issues.

By the time of the March 1962 advance refunding, congressional questions and criticisms against the new technique led to hearings before the Senate Finance Committee on March 14 and 16. Criticism centered particularly on the senior refundings in which World War II tap 2½'s had been replaced by the Treasury with long-term 3½ per cent bonds. The apparent increase in cost to the maturity date of the old issues was considered too great to be offset by the subsequent likely saving in interest. On the other hand, there seemed little or

no opposition to junior refundings since the eligible issues were due to be refunded relatively soon anyway. Thus, no truly senior advance refunding has been attempted since 1962.

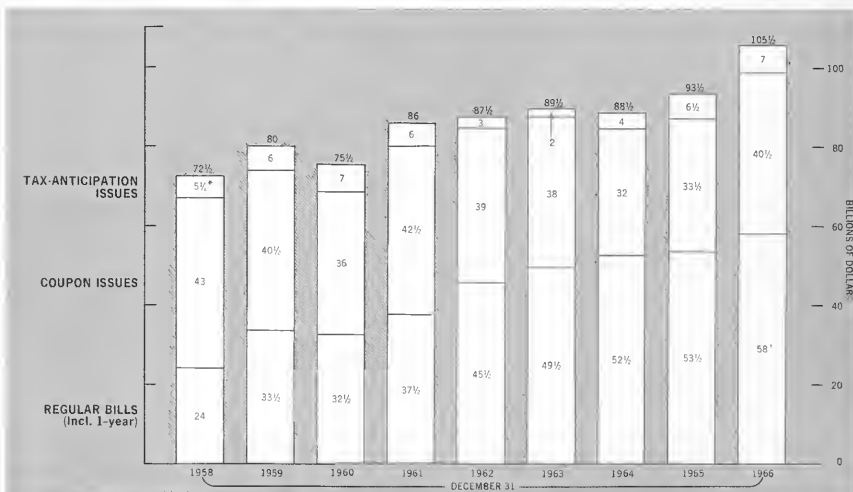
Another development resulted from the advance refunding of issues maturing within 1 year. In some cases making the offered issues attractive produced substantial "rights" values for the eligible issues. Holders unwilling to exchange "rights" were thus encouraged to sell in the market and to invest the proceeds temporarily in bills. This had the effect of depressing bill yields when the Treasury was actively seeking to increase such yields for balance of payments reasons. After the first such experience the sale of additional bills at the time or the announcement of the intention to sell bills was effectively used to prevent any substantial bill rate declines.

The pre-refunding of near maturities and junior advance refundings had other important aspects. By removing large blocks of early maturities, room was made for expanding the volume of regular bills without an undue increase

in short-term debt maturing within 1 year. As shown in Chart 2, this procedure was effective in holding the under-1-year marketable debt from 1958 through 1965 to an increase of \$21 billion. The volume of coupon issues declined from \$43 billion to \$33½ billion in that time, while regular bills grew by about \$30 billion. However, the sharp curtailment of advance refunding following the January 1965 operation was chiefly responsible for the rapid build-up of within-1-year debt during 1966.

In addition to making room for bills, advance refunding greatly reduced amounts of short-term issues in public hands by breaking up large concentrations of early maturities. This is clearly illustrated by Chart 3. From the second half of 1961 through 1966 advance refundings reduced maturing issues held by the public by between \$1 billion and \$9 billion, or an average of \$5½ billion for each semiannual period. By 1963, following the inception of pre-refunding, whereby issues maturing within 1 year were made eligible for advance refunding, the regular refunding burden was sharply

2 | COMPOSITION OF THE UNDER 1-YEAR MARKETABLE DEBT, 1958-66

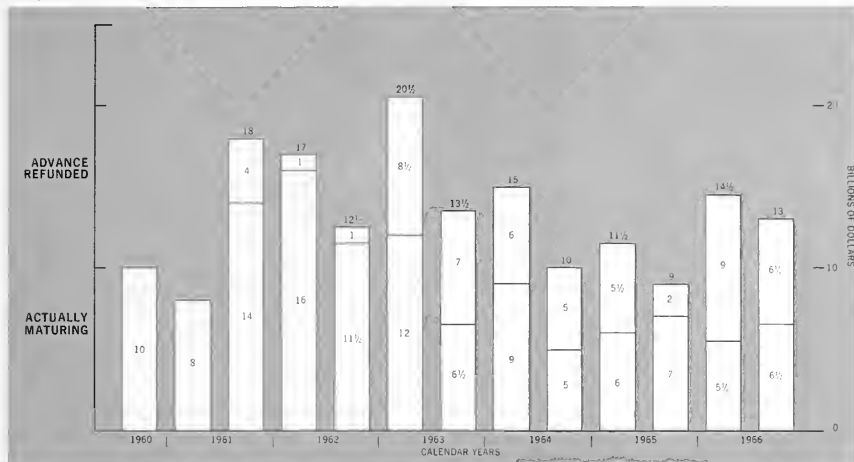


* Includes \$2.7 billion of special bills maturing May 15, 1959.

† Includes \$0.4 billion of 4-month bills dated Dec. 31, 1966, delivered Jan. 3, 1967.

NOTE.—Based on data from U.S. Treasury Dept.

3 PUBLICLY HELD TREASURY-ISSUE MATURITIES Effect of Advance Refundings in Reducing Actual Maturities Semiannually, July 1960 - December 1966



NOTE.—Data exclude regular weekly and 1-year bills and tax anticipation issues. Based on data from U.S. Treasury Dept.

reduced. By the second half of 1964, publicly held amounts to be rolled over each half year had declined to between \$5 billion and \$7 billion. These smaller maturities greatly facilitated the quarterly refunding operations and indeed, in some cases, made cash refundings easily successful when otherwise they might have been risky, if not impossible altogether. Moreover, the actual amounts by which early maturities were reduced understate considerably the true contribution of advance refunding to easier regular refunding. Without such reductions, most of the much larger original maturities, of necessity, would have been rolled over into short-term issues requiring refunding again after a year or two.

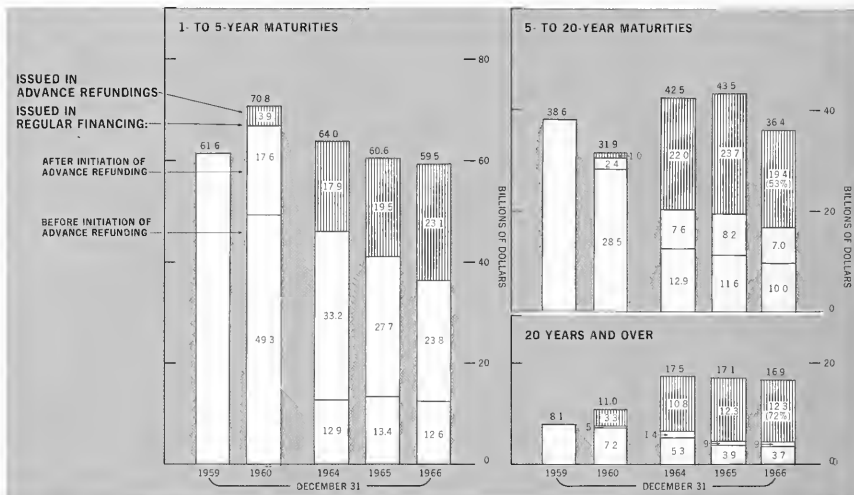
In some cases so much of an eligible issue was extended through advance refunding that the publicly held portion appeared too small for more than one option in the regular refunding at maturity. It was felt in such cases that if the resulting longer issue were too tiny, its market characteristics would be impaired. While this, of course, was true, it is clear that

advance refunding—in doing a good job of debt extension—had in effect already provided additional longer options.

The part played by advance refunding in restructuring the over-1-year marketable debt is amply demonstrated in Chart 4. By the end of 1959 the most vulnerable segment of intermediate- and long-term debt, the 1- to 5-year maturities, had increased to \$61½ billion. This portion of the debt poses the constant threat of dropping into the under-1-year category. When the Treasury is foreclosed by the 4¼ per cent limitation on bonds from extending beyond 5 years, this sensitive area of the maturity structure is likely to grow. By December 1960, 1- to 5-year debt had grown to nearly \$71 billion from \$40 billion 5 years earlier. The \$9 billion growth in 1960 occurred partly as a result of the pilot advance refunding in June that year, while the big senior refunding in October had no effect in that maturity area.

Thereafter, however, advance refunding played a very significant role in increasing the volume of issues with longer maturities. As

4 | STRUCTURE OF THE OVER 1-YEAR MARKETABLE DEBT, 1959-66



late as December 1966, advance refunding had accounted for 72 per cent of the \$17 billion in 20-year-or-longer bonds outstanding, and for 53 per cent of the diminished 5- to 20-year maturities. Even in the 1- to 5-year area 39 per cent of the outstanding issues had originated in advance refundings.

In summary, the importance of advance refunding in improving the structure of the marketable debt can scarcely be exaggerated. From June 1960 through January 1965 nearly \$68 billion of securities were extended into longer-term issues in 11 operations—an average of \$6.2 billion per operation, of which \$5.7 billion was publicly held. The scope of advance refundings gradually increased during the period. By combining as much as \$26½ billion and \$22 billion of publicly held eligible issues in the July 1964 and January 1965 operations, the Treasury brought about the extension of more than \$18 billion of those securities. Yet, despite these massive doses of debt extension and the upward pressure of the continuing economic expansion beginning in 1961, the impact on long-term interest rates

was modest. Rates on long-term Government bonds rose only moderately and private long-term rates very little, if at all. Not until July 1965, after the war in Vietnam was escalated, did interest rates begin to rise sharply.

BOND AUCTIONS

In 1962 the Treasury made arrangements and set forth rules for selling entire issues of long-term bonds to underwriting groups through competitive bidding. Immediately following each auction, the winning syndicate was to reoffer the bonds to the investing public at a price determined by the underwriters. The procedure, in essence, was similar to the normal method of selling corporate and municipal bonds through competitive bidding.

In these long-term bond auctions, the Treasury expected that at least three very large syndicates would compete, although under the rules, no acceptable group was prohibited from bidding. It was anticipated that each syndicate would include some of the big primary Government securities dealers and dealer banks, as

well as other dealers, brokers, and banks willing to be affiliated with the major members of the group. The basic idea behind the organization of these large marketing groups was to spread the risk of handling a large issue and to ensure as wide a distribution as possible of the bonds to the investing public.

The first auction—for bonds amounting to \$250 million—was held in January 1963. In its invitation to bid the Treasury announced that the issue could carry either a 4 or 4½ per cent coupon rate, and that it would mature in 30 years, but would become callable after 25 years. The winning bid at a price of 99.85111 per \$100 for the bonds as 4's of 1988–93 provided an interest cost to the Treasury of 4.008 per cent, and the bonds were reoffered at par. The reoffering was a success. The underwriters were able to dispose of the securities, terminate price restrictions, and dissolve the selling group in 2 days.

The Treasury held the second auction in April 1963 for \$300 million of bonds. The invitation to bid called for either 4's or 4½'s of 1988–94. The winning bid was 100.55119 on a 4½ per cent coupon at an interest cost of 4.093 per cent, and the bonds were reoffered at 100.75 to yield 4.082 per cent. However, this issue proved more difficult to sell than the first auction offering and remained bound by syndicate restrictions for some time. It so happened that the chances for the second offering to achieve a quick sellout were substantially dampened by the announcement of an impending large telephone company issue on the day of the Treasury auction.

The interest cost to the Treasury on the auction bonds was probably less than if they had been sold in regular financings. The yield spread on each of the auction issues was 8 basis points above prevailing Treasury market rates as compared with an average spread of about 12 basis points for regular Treasury offerings.

The new auction method of selling long-term bonds created a number of problems. First, the underwriting risk was great because the Government bond market is extremely sen-

sitive to economic and political news of all kinds, both domestic and foreign. Thus, the underwriters could not stand much exposure. Second, obtaining advance commitments from prospective investors was likely to be difficult, particularly in a cautious market environment. Third, the Government bond market is so broad, and one long-term Treasury issue is so much like another, that market stability in the maturity area of the new issue could not be successfully maintained by the winning syndicate. Attempts by the syndicate to stabilize the market would be very difficult, especially if the other market professionals were to sell the issue short. And fourth, the attitude of the Federal Reserve in maintaining an "even keel" during the auction and early reoffering period could not be expected to continue indefinitely.

As a result of the problems involved, syndicate underwriting of long-term bonds has not been used since April 1963. At the time, market circles held strongly that the risks of competitive bidding for an entire issue of long-term bonds were too great even if the amounts offered were limited to \$300 million or less.

PARTICIPATION CERTIFICATES

The sale of participation issues as a debt management tool originated in 1953 mainly as part of a generalized program to hold down the Federal debt subject to statutory limit, but the budgetary effect was also recognized. The first PC's—the Commodity Credit Corporation (CCC) certificates of interest—were (and still were through 1966) short-term instruments of participation in a pool of crop loans. They have been taken mostly by commercial banks, have been subject to redemption on demand, and have been guaranteed by the CCC.

For a number of years the CCC certificates of interest were the only PC's offered by the Federal Government, except for a small Reconstruction Finance Corporation (RFC) issue in 1954, which was liquidated 2 years later. Ordinarily, PC's of the CCC result when crop loans are taken over by banks or other financial institutions, instead of being presented for pay-

ment by the Government. In that way the CCC PC's reduce expenditures for loans and at the same time do not add to the debt.

In fuller explanation, the proceeds of PC sales have a twofold fiscal effect: When deposited in the general fund balance, the proceeds diminish the Treasury's refunding or new borrowing needs. Thus, the public debt is reduced or prevented from increasing as much as it would have without the PC's. The explanation of the effect on budget expenditures is more complicated. The money for most Federal credit programs is drawn from revolving funds set up under congressional authorizations. Drawings by the agencies represent borrowings from the Treasury; as these agencies make loans to the public, the funds used become budget expenditures. The process is reversed when loans are repaid by the public, or are sold to private investors, or when PC's are issued. As the repayments or the proceeds of outright sales or of PC's were deposited in the Treasury's balance, they became negative budget expenditures, and at the same time agency indebtedness to the Treasury was reduced. It should also be stressed, however, that PC sales represented some replenishment of loanable funds for the credit programs.

To stem the rising tide of private loans and mortgages held by the Government, outright sales of financial assets had been actively pursued under some programs. However, these were clearly not large enough to affect the rapid, over-all growth of Federally financed credit to the public. To study this and other related problems, the President appointed a Committee on Federal Credit Programs, with the Secretary of the Treasury as Chairman. The Committee submitted its report in February 1963, and among its many recommendations the report strongly urged that private financing should be substituted for public credit whenever it was feasible to do so. In this regard the sale of participations in pools of Federal-agency-held loans and mortgages seemed to promise the speediest approach for implementing the Committee's recommendation.

Even before the Federal Credit Programs Committee report, the Export-Import Bank of Washington (Eximbank) in 1962 had begun to issue PC's against a pool of selected foreign loans in its portfolio. These certificates were originally 10-year obligations (later 7-year) with semiannual level amortizations of principal to coincide roughly with the amortization schedules of the loans in the pool. The certificates were offered only to commercial banks, mainly those with a substantial interest in foreign loans. By the terms of the offerings, the Eximbank PC's had limited negotiability, in that the banks originally subscribing could sell only subparticipations to correspondent banks or other affiliated institutions. To make up for this lack of liquidity, the participations were made subject to redemption in part or in full at the option of the holder or of the Eximbank beginning 2½ years from issue date. As a source of funds, additional issues of PC's were sold by the Eximbank from time to time without appreciably changing the basic terms of the instrument.

In pursuance of the Federal Credit Programs Committee recommendation on an enlarged role for private credit, active consideration began to be given to expanding the scope of participation offerings. After intensive study, legislation was introduced and enacted in September 1964 empowering the Federal National Mortgage Association (FNMA) to act as trustee for pooling Federal-agency-held mortgages as the backing for a new type of PC offering. In effect, marketing of these PC's represented the sale of the interest and principal payments on the mortgages. Accordingly, the PC's were arranged to mature serially to correspond with the payments inflow. In the mortgage field, PC's have distinct advantages over outright sales of mortgages: They remove the risk of default; they eliminate servicing costs; and they attract investors otherwise not interested in mortgages directly.

The mortgages involved in the first PC offerings were from FNMA's Management and Liquidation and Special Assistance portfolios and from the portfolio of the Veterans Admin-

istration (VA). FNMA sold the initial PC offering in November 1964, as a \$300 million, 10-year serial issue with \$30 million maturing each year.

The marketing arrangement as originally set up remained essentially unchanged through 1966. Under this arrangement PC offerings were awarded by FNMA to one very large underwriting syndicate, which in turn reoffered them to the investing public at prescribed interest rates and prices. The rate and price for each of the maturities making up the issue were determined by negotiation between the syndicate and FNMA, with Treasury concurrence. Also included was a scale of underwriting charges or commissions for each of the serial maturities paid by FNMA.

Aside from rates and prices, the terms and conditions of the FNMA PC's posed a number of market problems. For example, some of the serial maturities were unpopular and hard to sell; the amount of each serial maturity was small, making dealer operations in the secondary market difficult and risky; although negotiable, the PC's were all registered, requiring more time for transfer and handling; and the guarantee by FNMA, though backed by a letter from the Secretary of the Treasury regarding Treasury willingness to lend funds to FNMA, if necessary, for servicing the PC's, was not considered by some to be fully binding legally.

After the first few offerings, the receptivity of the market to FNMA PC's declined in the rapidly rising interest-rate environment following the enlargement of the war in Southeast Asia. During the same period the environment for Eximbank offerings weakened as demand for bank credit increased sharply. Despite attempts to make the Eximbank-type PC's more attractive by reducing the time to earliest redemption by holders and by making them eligible for discounting by the Federal Reserve, the Eximbank found it increasingly difficult to sell PC's at reasonable rates of interest.

To increase further the role of private credit, and in view of the greater need for funds primarily as a result of the war, plans

for an expanded PC program went forward, culminating in the Participation Sales Act of 1966, passed in May. Under the statute the potential coverage of credit programs subject to inclusion in participation pools was substantially enlarged. To provide for congressional control, the Act requires congressional approval, through appropriations, to cover any insufficiency of the pools to service the PC's. In addition, the legislation authorizes the Treasury to coordinate the PC offerings with its debt management operations and to approve the direct sales of certain financial assets. The programs and agencies listed in the Act are:

Direct loans of the Farmers Home Administration, Department of Agriculture, relating to farm operations, farm ownership, housing, and soil and water;

Loans for academic facilities by the Office of Education, Department of Health, Education, and Welfare;

Loans and mortgages held by the Department of Housing and Urban Development except those related to secondary market operations of FNMA;

Loans and mortgages held by the VA;

Loans held by the Eximbank;

Loans held by the Small Business Administration.

According to the House Banking and Currency Committee report on the participation sales bill, the level of all direct Federal loans outstanding on June 30, 1966, was estimated at \$33.3 billion, assuming all PC sales contemplated in the January 1966 budget document had been completed. Of this amount, however, only some \$10 billion to \$11 billion of financial assets were in programs listed in the act.

During the second quarter of 1966, yields on Federal agency issues and PC's rose sharply relative to Treasury market rates as private and public credit demands soared. Federal agencies were faced with greatly increased demands from those unable to borrow from banks and other sources. In consequence, the agencies—particularly the home loan banks, FNMA, and the farm credit agencies—in-

creased their market borrowing. Together with the expanded PC program called for by the budget for fiscal year 1967, these demands created a very depressed and unhealthy atmosphere in the credit markets. By late August the markets had become so severely tightened that interest rates rose to the highest levels in 40 years or more.

In this situation the administration acted vigorously to dispel apprehension and to ease pressures on the money and capital markets. In addition to other measures, the President, on September 9, 1966, requested the curtailment of agency borrowing. The next day the Secretary of the Treasury announced that scheduled sales of PC's would be postponed until the credit markets improved, and any new money to meet Federal agency needs in excess of maturities would be provided by the Government Investment Accounts.

As a result of official measures to relieve pressures, interest rates dropped quickly and the tightness in the money and capital markets gradually eased. Toward the end of the year, the environment was considered appropriate for FNMA to announce the first offering of PC's following the early September postponement. Additional legislation providing congressional authorization to meet insufficiencies of interest from the loan pools to service PC interest payments was enacted in September.

In the meantime, while market receptivity to the growing volume of PC's was reaching a low ebb during the summer of 1966, meetings were held among market participants, representatives of the Treasury, the Bureau of the Budget, FNMA, and other interested agencies to discuss measures for improving the market characteristics of PC's. Most of the suggestions of the market professionals were adopted for the FNMA PC's announced in December. These included: the concentration of one offering into as few as two or three separate maturities, instead of small annual serial maturities; optional bearer or registered forms of the certificates; denominational exchanges of coupon issues to be provided by the Federal Reserve Banks of New York, Chicago, and

San Francisco; wire transfer facilities among these major money market centers; and an opinion by the Attorney General that PC's are full faith and credit instruments of the United States.

Sales of participation certificates from 1962 through 1966 totaled about \$5¾ billion. Of this amount about \$4 billion remained outstanding on December 31, 1966, after redemptions, amortizations, and maturities. The shift of these amounts from Federal to private credit required some degree of experimentation. By and large, however, there is reason to believe that through adequate coordination with Treasury debt management and Federal agency borrowing operations, PC's could have continued to play a useful and beneficial fiscal role.

INNOVATIONS IN NONMARKETABLE ISSUES

The history of debt management innovations would be incomplete without mentioning developments in the area of nonmarketable Treasury securities. Although such issues do not have a direct impact on the market, they have important effects in changing the supply of marketable issues and in carrying out broad debt management and national economic policy objectives.

Savings bonds. By the spring of 1959, the savings bond program was faltering and in evident trouble. Sales of Series E and H bonds had declined from \$5.3 billion in fiscal year 1956 to \$4.5 billion in 1959; in the latter year the net cash drain—the excess of redemptions over sales—reached more than \$0.6 billion.

Twice before, in 1952 and again in 1957, the Treasury had raised savings bond rates by small fractions of 1 per cent: first, from 2.9 to 3 per cent to maturity in May 1952 and then from 3 to 3¾ per cent in February 1957. As rate competition for savings sharpened, the 3¾ per cent became clearly inadequate. Accordingly, the Treasury requested legislation permitting the rate to maturity on savings bonds to be increased to 3¾ per cent begin-

ning in June 1959. The enacted legislation raised the maximum allowable savings bond rate to $\frac{3}{4}$ per cent, provided the President found that the increase would be in the national interest.

Additionally, the Treasury asked for and was granted statutory permission to raise future earning rates on all outstanding E and H bonds. Under this innovation yields for the remaining period to the next maturity were increased generally by $\frac{1}{2}$ of 1 per cent, the same increase as provided on new E and H bonds to maturity. The higher rates on outstanding bonds eliminated any incentive to switch out of old bonds into new ones and greatly reduced incentives to move out of savings bonds altogether. In asking the Congress for permission to raise earning rates on outstanding bonds, the Treasury also felt that it has something of a trusteeship function on behalf of millions of individual savers who do not follow interest-rate trends closely, and that on the grounds of equity, these holders were entitled to the increased earning rates.

The new rates worked quite well in bringing a turnaround in the program, and between June 1959 and June 1965 the volume of outstanding E and H bonds increased by more than \$6 billion. During this period, the relative stability of long-term interest rates was a strong factor in sustaining the performance of the program.

In the fall of 1965 as competition for savings intensified, E and H bond sales were again flagging and redemptions rising. In consequence, the Treasury asked the President to raise the rate to maturity on new bonds from 3.75 to 4.15 per cent, and increased the earning rates on outstanding bonds to next maturity by 0.4 per cent. Despite the extreme intensification of the competition for savings in 1966, the E and H bond program performed remarkably well after the announcement of the improvement in savings bond rates in February 1966. In the ensuing 10 months to the end of the year, the amount of E and H savings bonds outstanding grew by nearly \$1.0 billion to \$50.2 billion. This represented a total in-

crease of \$7½ billion in the 7½ years from mid-1959 to December 1966, or an average growth rate of \$1 billion per year.

Coincidentally, the average rate of growth in E and H bonds outstanding during the 20 years ending 1966, although anything but constant, was also \$1 billion a year, or a total of about \$20 billion. This is \$20 billion the Treasury did not have to raise in the market, making possible an \$8½ billion decrease in all other publicly held Federal debt during that period instead of an \$11½ billion increase.

Retirement Bonds. In January 1963 the Treasury introduced United States Retirement Plan Bonds to provide an alternative investment medium under the Self-Employed Individuals Tax Retirement Act of 1962 (26 U.S.C. 401-05). As a parallel to retirement and pension plans covering employees only, the Act affords self-employed persons the opportunity to set up retirement plans subject to approval by the Internal Revenue Service.

Under an approved plan, any qualified self-employed person (for himself and his employees) is entitled to deduct 10 per cent or \$2,500, whichever is less, from the net income of each person for retirement purposes. The retirement funds, including earnings thereon, become taxable to the retiree as the money is disbursed upon retirement, or beginning at age 59½, or earlier disability, or at death. Most approved self-employed retirement plans are administered by bank and insurance company trustees or as custodial accounts, with fairly wide latitude for the investment of the funds. These may be various types of public and private securities including equities. There are, of course, administrative expenses for managing or maintaining custody of the retirement fund investments.

United States Retirement Bonds were designed as an investment medium wherein no administrative cost would be involved. Other advantages of these bonds are: (1) safety regarding risk of default; (2) a guaranteed level rate of return until they are redeemed; (3) ready availability throughout the country at banks and other financial institutions, or di-

rectly from Federal Reserve Banks, or the U.S. Treasury; and (4) the fact that income from these retirement plan bonds is not subject to estate taxes.

The rate of earning on United States Retirement Bonds has generally been the same as that on new Series E and H savings bonds. Retirement bonds were not actively promoted by the U.S. Treasury, but they do represent a significant investment outlet to many self-employed persons. The fact is, however, that by the end of calendar year 1966, only \$18 million were outstanding.

Foreign-series securities. Nonmarketable securities issued to foreign central banks and governments, payable in dollars, were introduced in August 1961 under the authority of the Second Liberty Bond Act. These issues include certificates, generally 3 months to maturity; 1- to 5-year notes; and bonds, which in practice have had maturities between 1 and 7 years. Most foreign-series securities have been issued for special purposes.

In general, the foreign-series certificates were made redeemable in whole or in part at the option of the holder on 2 days' notice, and longer issues were usually made convertible into 3-month certificates. In special cases certain over-1-year maturities have been redeemable at the option of the United States while others, by prior agreement, have been made subject to redemption before maturity. In all cases payments on early redemption are at par.

The principal purposes of the foreign-series securities have been: to insulate certain large transactions from having a major impact on the U.S. Government securities markets; to provide issues that are not subject to market risk; to furnish longer-term investment media for facilitating certain types of bilateral financial arrangements; to finance currency swap agreements; and to induce long-term capital inflows, which improve the U.S. balance of payments position.

Although not all of these purposes are common to all transactions, they are interrelated. For example, in a swap transaction, West German marks may be obtained by the United

States in exchange for dollars. Instead of using those dollars to buy a large block of marketable issues, the German central bank might invest in nonmarketable foreign-series, 3-month certificates at the going rate on 3-month bills. The German marks received in exchange by the United States would thus increase foreign exchange reserves for payments purposes or for protecting the position of the dollar.

The nonmarketable foreign bonds issued in 1964 to Canada in connection with the Columbia River project and treaty provide an example of the use of longer-term foreign-series securities for bilateral financial arrangements. The agreement called for project funds to be raised in the United States and accordingly \$254 million was turned over to the Canadian Government, which then transferred \$204 million in Canadian dollars to the British Columbia Government to pay for construction costs. Of the \$254 million U.S. dollars, \$50 million was used to pay off U.S. commercial bank loans to British Columbia. The remaining \$204 million of such dollars was invested by the Canadian Government in nonmarketable, U.S. foreign-series nonconvertible bonds, to prevent the transaction from having an immediate balance of payments impact. The bonds were arranged to mature serially in equal amounts over a 7-year period, and as the bonds are paid off, the U.S. dollars received are added to Canadian foreign exchange reserves.

The outstanding amount of foreign-series issues grew to a peak of nearly \$1.2 billion in November 1965. After that these issues declined to about \$600 million by the end of 1966. Of this amount, nearly \$330 million was in over-1-year convertible issues, which do not enter into U.S. international payments deficits on the "liquidity balance" basis.

Foreign-currency-series securities. In October 1961 the Treasury began to sell nonmarketable securities payable in foreign currencies to official foreign entities. As in the case of the nonmarketable foreign issues payable in U.S. dollars, the authority to provide these securities stems from the Second Liberty Bond Act.

The use of such issues originated during World War I when Treasury certificates of indebtedness denominated in Spanish currency were given in payment for war materiel purchased in that country.

Originally, foreign-currency-series securities could be either certificates of indebtedness with maturities of 1 year or less, or bonds not limited in any way as to the term to maturity. Issuing foreign-currency bonds gave the Treasury full leeway to provide maturities upwards of 1 year as long as the interest rates paid remained $4\frac{1}{4}$ per cent or less. Since the rates on foreign-currency issues have generally been determined by market yields on Treasury issues of comparable maturity, the statutory $4\frac{1}{4}$ per cent interest limit effectively foreclosed the issuance of bonds when market rates rose above that level. Accordingly, the Treasury requested legislation, which was passed in November 1966, to permit also the issuance of foreign-currency-series notes having original maturities of 1 to 5 years.

Through 1966 most foreign-currency certificates had an original maturity of 3 months, usually subject to redemption on 2 days' notice. The longer issues generally had original maturities of 15 to 24 months and most were made convertible into 3-month certificates, or were redeemable, usually at the option of the holder. Others were made payable before maturity according to prior agreement or were callable by the U.S. Treasury. In all cases of early redemption, payments are at par.

The basic purposes of the new foreign-currency issues were to provide a supply of foreign exchange for conducting operations to defend the U.S. dollar, to help cushion demands on the U.S. gold stock by adding a new investment medium for foreign central banks and governments, and to assist in meeting U.S. balance of payments deficits. In addition, the foreign-currency securities have proved to be a useful device for temporarily augmenting international liquidity.

The more immediate developments leading to the introduction of foreign-currency issues started in 1959, after a number of major coun-

tries had moved to currency convertibility. This greatly increased the potential for large-scale flows of funds from the United States to foreign markets seeking higher rates of return. In turn, such movements could create exchange-rate difficulties and produce an adverse impact on the balance of payments.

As the United States continued to sustain balance of payments deficits, foreign official efforts to stabilize exchange rates produced a flow of dollars into the hands of central banks in countries with favorable payments balances. Most of these dollars were invested at interest in short-term marketable Treasury issues to satisfy liquidity needs. Although these investments represented a reduction in potential drain of U.S. gold, they did not fully meet other needs.

Although their use has been substantially reduced since the mid-1960's, the foreign-currency-series securities do furnish another investment alternative, thus helping to reduce the demand for U.S. gold; they also directly provide the United States with foreign currency needed to protect the dollar against speculation and to meet day-to-day requirements arising from trade, tourism, foreign aid, military commitments abroad, and so forth. Ordinarily foreign currency is bought with dollars. But in a situation of sustained balance of payments deficits, the purchase of foreign exchange with dollars would only increase the amount of dollars in foreign hands. The technique of borrowing foreign currency was used to avoid the build-up of foreign dollar holdings.

In addition to providing foreign exchange, foreign-currency issues maturing beyond 1 year count as long-term investments. These issues bring U.S. international accounts into closer balance on the generally accepted "liquidity balance of payments" basis, because they are nonconvertible bonds or notes, which cannot be optionally exchanged for certificates or redeemed before 1 year.

Aside from being liquid earning assets to central banks and governments, issues payable in foreign currencies are riskless in that they protect the lender against exchange risk.

Through 1966 foreign-currency issues were denominated in Austrian schillings, Belgian francs, German marks, Italian lire, and Swiss francs. The volume of foreign-currency series outstanding rose to a peak of \$1.3 billion in

September 1965, but by the end of 1966 the amount had declined to \$860 million. Of this total about \$750 million was subject to redemption or conversion at the option of the holder.

III. MARKET IMPACT AND ANALYSIS OF MAJOR NEW TECHNIQUES¹

INNOVATIONS IN TREASURY BILLS

By the end of the calendar year 1966, regularly offered Treasury bills (excluding the seasonal tax-anticipation series) had risen to nearly 2½ times the amount outstanding at the beginning of December 1958—from \$23½ billion to \$57¾ billion. This \$34¼ billion rise was by far the largest growth in any category of the public debt over the period, and it represented more than 70 per cent of the increase in the total public debt. The increase in the volume of Treasury bills in the 8 years after 1958 took place during two expansions of the economy and one recession. By and large it occurred without undue strains on the money market except in early 1960 and in September 1966 at the crests of the interest-rate cycle. To a considerable degree the successful expansion program was the result of careful use of the new techniques and innovations.

The 6-month bill. The 6-month bill did not achieve full market acceptance immediately. Originally the new bills were offered in amounts of \$400 million each week while offerings of 3-month bills were reduced from \$1,800 million to \$1,600 million. By June 1959, when the Treasury upped its offerings of 6-month bills to \$500 million while the 3-month bill offerings had declined to between \$1.0 billion and \$1.2 billion, average discount rates on new 3- and 6-month bills had moved up sharply and the spread between them had climbed from an average of about 25 basis points in the first few auctions to a high of 81 basis points. In consequence, the \$500 million, 6-month bill cycle was not completed until the

second half of calendar year 1960. By that time the peak of interest rates had been passed and the economic recession was well under way. (See Appendix Table 1 for 3- and 6-month bill auction rates.)

The low point in Treasury short-term borrowing rates was reached in April 1961, at average auction rates of 2.18 per cent for 3 months and 2.30 per cent for 6 months. By contrast, in the 1957–58 recession the low point for 3-month bills was 0.64 per cent. In the next economic expansion, starting in the spring of 1961, short-term rates did not really begin to rise until after the first offering of a strip of bills had been made in June of that year and after the supply of 6-month bills had been increased to \$600 million per week.

By the late spring of 1961, the 6-month Treasury bill was achieving full market acceptance. The coverage ratio—that is, the ratio of subscriptions to allotments—was averaging nearly 220 per cent versus 185 per cent for the 3-month bill. This occurred despite the increase in the weekly offerings of 6-month bills to \$500 million, while the 3-month offerings had been gradually reduced from \$1.8 billion before the introduction of the longer bill to about \$1.1 billion in 1961. During the period from the cyclical high in rates in January 1960 to mid-1961, the spread in average discount rates between the two maturities had declined to about 15 basis points, indicating a growing awareness of the greater gain potential in the longer bills. (See Appendix Table 3.)

Also during this period, bidding in the 6-month auctions became increasingly sophisticated. From 1959 to mid-1961, the range in an auction from the average of all successful bid prices to the stop-out, the lowest accepted

¹ Background tables and other material will be found in the Appendix.

bid, narrowed significantly. Expressed in terms of yields, the range from the average bid rate to the stop-out rate declined from 4 basis points to 1 basis point.

While the decline in average rate spreads between the 3- and 6-month bills may well be attributed to expectations of greater gains on the longer bills in a falling-interest-rate environment, the increased concentration of bids demonstrates more clearly market acceptance of the 6-month bill.

By the end of 1963, following the Federal Reserve discount rate increase from 3 to $3\frac{1}{2}$ per cent, rates in the weekly auctions had also risen to $3\frac{1}{2}$ per cent or more. The increase in rates reflected the enlarged volume of weekly offerings as the amount of 3-month bills issued each week had grown to \$1.3 billion, and of 6-month bills to \$0.8 billion. As a result of a \$1.0 billion bill-strip-offering in October 1963, which added \$100 million to 10 weekly maturities in the 26-week cycle, the total volume of weekly bills outstanding had increased to \$38.5 billion, of which bills originally 6 months to maturity accounted for \$21.8 billion or about 57 per cent.

Despite the growth in the volume of the longer bills and the increases in short-term interest rates that had taken place between mid-1961 and December 1963, monthly-average rate spreads in the weekly auctions between the two maturities declined from about 25 basis points in December 1958 to 14 basis points in December 1963. At times the spreads reached a low of 3 basis points, and they averaged 15 basis points during the period. In corroboration of the market's receptivity of the 6-month bill in a rising-interest-rate environment, the high concentration of bids around the auction averages continued without significant change.

During 1964, offerings of 6-month bills were gradually increased to \$1.0 billion per week by the fall, while the 3-month bill was reduced from \$1.3 billion to \$1.2 billion during most of the period. Rates in the auctions had moved close to 4 per cent after the discount rate increase in November, but during

the year, monthly average spreads did not rise above 20 basis points, and they were generally considerably less. Subscription coverage on the longer of the two maturities had slipped a little, but it was still close to 190 per cent during the fourth quarter of 1964 as compared with 175 per cent for 3-month bills. The bids on 6-month bills continued to be closely bunched around the average rate, and the yield range between the auction average and the stop-out was usually less than 1 basis point. By this time, also, dealer net positions in over-92-day bills were running two to three times as large as in shorter bills. It is quite likely that with an upward-sloping yield curve continuing in the short-term area the market felt there was still a greater propensity for gain in the longer bills.

Despite the escalation of the war in Vietnam in July 1965, the situation with respect to the usual measures of market receptivity did not change appreciably. During this period rates on 3- and 6-month bills gradually rose, and they were about $4\frac{1}{8}$ and $4\frac{1}{4}$ per cent by early December before the discount rate was increased to $4\frac{1}{2}$ per cent.

Following the increase in the discount rate, bill rates again rose rapidly and after a pause during the first half of 1966, they jumped to the highest levels in 40 years. In the meantime, dealer net positions in bills dwindled in response to expectations of higher rates in the short-term area, and by June 1966 they were at the lowest points since such statistics became available in 1960. Weekly offerings of 3-month bills had again increased to \$1.3 billion, but the spread between the two maturities gradually widened and reached a high of 50 basis points in early September 1966, during the period of extreme tightness that developed in the credit markets. Two weeks later, following vigorous action by the administration to allay apprehensions and relieve the pressure of Federal agency borrowings and PC offerings, the average levels in the auctions reached peaks of 5.59 per cent on the 3-month and 6.04 per cent on the 6-month bill.

The jump in bill rates was touched off by realization that part of the burden of Govern-

ment financing and foregone PC sales would have to be borne by the bill market. Market hesitance in the auctions was demonstrated by the widened range from the average rate to the stop-out, which in the case of 6-month bills fluctuated sharply from 1 to more than 6 basis points in the third quarter. Oddly enough, however, during this period the ratio of subscriptions to allotments on both the 3- and 6-month bills remained remarkably constant, hovering around 170 per cent for the former and around 200 per cent for the latter.

In the fall of 1966, as tightness in the credit markets was gradually eased, bill rates began to decline, and with that the spreads between average rates on 3- and 6-month bills in the weekly auctions dropped to less than 10 basis points by the year-end. In further evidence of the return to more normal conditions, the range of bids from the average to the stop-out was reduced to less than a basis point in November and December. At the same time, dealer positions in bills maturing beyond 92 days rose sharply, indicating again the greater gain potential on longer bills.

In summary, the market adjusted extremely well to the increased volume of 6-month Treasury bills. In the process, the amount of weekly bills outstanding grew from \$23½ billion in December 1958 at the start of the 6-month bill cycle to nearly \$43 billion at the end of 1966. Of that total, \$26 billion, or 60 per cent, originated in 6-month bills. During the same period the weekly offerings increased only from \$1.8 billion to \$2.3 billion.

The 1-year bill. A quarterly cycle of 1-year bills was originated in 1959. Issues of such bills that year averaged \$2.0 billion per quarter and about 330 days to maturity. Each offering was adequately covered by the subscriptions, with an average coverage ratio of 176 per cent. This is not surprising because payment through tax-and-loan-account credit was permitted. The new bill cycle was expensive by comparison with coupon-issue yields in the market. The 4.20 per cent average bank discount rate in the auctions adjusted to a coupon-equivalent yield basis of 4.41 per cent was 38 basis points more

than the rates on comparable coupon issues. And that did not include the value of the tax-and-loan-account credit created, which would have added an estimated 31 basis points to the spread. It should be recalled, however, that 1959 was a year of rapidly rising interest rates, an environment not very conducive to the successful introduction of a new instrument. (For details on annual bills see Appendix Table 4.)

On the first rollover of the 1-year bill cycle in January 1960 the amount of the issue was cut back to \$1.5 billion. Despite the reduction in offerings, the cost of the January 15, 1960, 1-year bill (average discount rate) was 5.07 per cent. This was equivalent to a coupon yield of 5.36 per cent and was the highest rate of interest paid by the Treasury for any issue in the 1958–61 interest-rate cycle.

The next 1-year bill auction—in April 1960, with \$2.0 billion offered—resulted in a coupon-equivalent yield of 4.84 per cent, which was 23 basis points lower. But the spread of 1.03 per cent above the comparable 1-year-coupon-issue rate was the largest in the quarterly cycle, if the value of tax-and-loan-account credit in the first four auctions in 1959 is disregarded. The apathetic bidding in this auction is easily seen in the range of bids from the average to the stop-out, a high for the 1-year bill cycle of 13 basis points in terms of yield. Thereafter, the amounts in the next three offerings were cut back to \$1.5 billion; after that they were restored to \$2.0 billion through July 1962. During this period the coverage ratio picked up from an average of 148 per cent in the first two auctions of 1960 to 209 per cent in the next three, but ranged from 173 to 208 per cent when offerings were increased to \$2.0 billion. Following the cut-backs to \$1.5 billion, the concentration of bids around the average returned to more normal ranges.

For the remaining year of the quarterly cycle through July 1963, the amount offered in three of the four quarters was raised to \$2.5 billion whereas in the other quarter it stayed at \$2.0 billion. Thus, by the time the monthly cycle was introduced, the total amount of

annual bills outstanding had risen to \$9.5 billion. During this period the coverage ratio did not change significantly on the average, but other measures indicated improving market acceptance.

For the quarterly cycle as a whole, nonbank dealer awards ranged from 19 to 35 per cent of total public allotments—excluding the offerings paid through tax-and-loan-account credit, which were awarded almost entirely to commercial banks. The average of 25 per cent for nonbank dealer awards to total allotments for the quarterly bills compares with 21 per cent on 3- and 6-month bills during the same period. This indicates a greater participation of sophisticated bidders in the 1-year bill auction.

During the period from July 1960 to July 1963 the range of bids in the quarterly auctions from the midpoint to the stop-out declined to about $\frac{1}{2}$ of 1 basis point. However, the spreads of coupon-equivalent rates above coupon-issue yields fluctuated sharply, ranging from 4 basis points less than 1-year-coupon-issue yields to 52 basis points more. The higher spreads generally coincided with efforts to raise short-term rates to be more competitive with rates abroad.

The \$1.0 billion per month cycle, which began in August 1963, met with a much better market reception than the quarterly cycle. The subscription coverage averaged about 225 per cent from the fall of 1963 through the end of 1964. While this is not significant in view of the smaller amounts offered, other measures of market acceptance clearly showed the preference for the monthly cycle. Spreads above coupon-issue rates narrowed significantly, averaging about 12 basis points through the middle of 1966 as compared with more than twice that average spread for all of the issues in the quarterly cycle. Moreover, nonbank dealer awards as a percentage of total public allotments in the monthly cycle through mid-1966 increased to an average of 43 per cent from 25 per cent for the quarterly offerings.

Under the extreme monetary tightness that developed in the summer of 1966, the spread above comparable coupon-issue yields rose to

a high of 44 basis points in August and remained fairly high for the next three issues, following the introduction of the 9-month bill. However, the range of bids from the average to the stop-out rose to 10 basis points in June 1966, but the range in other monthly auctions did not exceed 4 basis points. In December the spread above coupon-issue yields declined to normal levels once again as market expectations improved in an environment clearly reflecting moves toward further monetary ease. In the second half of 1966, public allotments dropped to 75 per cent of total offerings; during this period, the percentage of nonbank dealer awards to public allotments fell to 23 per cent in the August auction, but picked up again when the credit markets began to improve.

In summary, as a monthly cycle, the 1-year bill performed quite well in the market by any standard of measurement. Because it is an auction instrument, however, it tends to become relatively expensive in a tight money market environment or when confidence in the going structure of interest rates has been shaken.

The 9-month bill. The brief history of the 9-month bill, which began in September 1966, provides only a short-run opportunity for analysis. Coverage ratios on the four \$500 million monthly offerings in 1966 averaged 217 per cent. However, only 83 per cent, or \$1.7 billion of the \$2.0 billion total, was allotted to public holders. Of the \$1.7 billion in public allotments, 41 per cent was awarded to nonbank dealers. In comparison, the simultaneous 1-year bill auctions produced an average coverage ratio of 210 per cent for the four \$900 million offerings. In those auctions 79 per cent, or \$2.8 billion, was allotted to the public, of which the dealers were awarded 44 per cent. (See Appendix Table 5.)

In the four 9-month auctions of 1966 the range of successful bids from the average to the stop-out was somewhat greater than for the annual bills. The average range was nearly 3 basis points as against 2 basis points for 1-year bills, but the difference may easily be at-

tributed to the newness of the 9-month instrument.

In comparison with coupon-issue yields in the market, the four 9-month bills averaged 5.72 per cent (coupon-equivalent) for a spread of 26 basis points above comparable coupon issues, while the annual bills auctioned at the same time averaged 5.74 per cent, about 27 basis points above 1-year-coupon-issue yields.

Thus, the early performance of the 9-month bill was about on a par with the annual bill by any of these standards of comparison, which implies that the relative sizes of the amounts offered—\$500 million per month of the 9-month bill versus \$900 million of the 1-year—represented a good balance between the two.

Bill strips. From June 1961, when the first offerings were made, through 1966, six strips of bills totaling \$6.8 billion were issued. That amount included a \$1.2 billion strip of three month-end maturing bills issued in November 1966 as part of the 9-month cycle. (For details on strips of bills see Appendix Table 6.)

The first bill strip covered 18 maturities of \$100 million each, with terms ranging from 8 to 25 weeks. The strip was sold at an average bank discount rate of 2.31 per cent with pay-

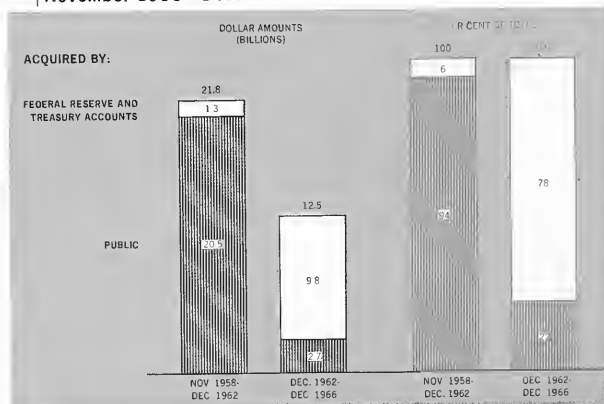
ment through tax-and-loan-account credit, which was estimated to be worth 50 basis points. Taking that into account, the spread above the average of going rates on comparable bill maturities was 35 basis points.

In June 1961, when the first strip of bills was offered, short-term rates were declining and the strip had no significant effect in turning rates upward. However, each subsequent strip of weekly bills had a substantial impact on the market. For example, in November 1961 the 3-month bill rate rose 14 basis points between the announcement date for the strip of bills and the day of the auction, and it rose another 17 basis points between the auction and the payment date.

The degree of market impact is difficult to assess in each case because some of the effects of the strip offering were anticipated by the market as an aftermath of pre- or junior advance refundings, which tended to put downward pressure on bill rates as rights were liquidated by holders not interested in the advance refunding offer.

All of the strips were well covered, with subscriptions ranging from 190 to 259 per cent of allotments. Official accounts did not take part in the strip offerings; all of the offer-

5 INCREASES IN REGULAR BILLS OUTSTANDING, November 1958 - December 1966



ings were publicly allotted. Awards to non-bank dealers averaged 55 per cent of total allotments for the four strips for which payment through tax and loan accounts was not permitted. In the last two of these, nonbank dealers accounted for 67 per cent of total allotments, indicating that sophisticated bidders were getting an increasing share of awards of bill strips.

Summary of innovations in bills. The amount of regularly issued bills outstanding prior to the advent of the 6-month bill in December 1958 increased by $2\frac{1}{2}$ times by the end of 1966. By and large, this substantial increase was smoothly absorbed by the market. For the most part, the increase occurred during an 8-year period of widely fluctuating short-term rates. From the start of the economic expansion, beginning in 1961, through 1966 average discount rates in the 3- and 6-month bill auctions ranged from 2.2 and 2.3 per cent, respectively, at the 1961 low points to 5.6 and 6.0 per cent at the peak in September 1966, and the range on annual bills was almost as great. About one-half of the $3\frac{1}{4}$ to 334 percentage-point rise in bill rates took place in the 9 months after the increase in the Federal Reserve discount rate in December 1965. Even so, the bill market operated with little strain until the period of sharp market tension in the late summer of 1966. After administration action to dispel fears and to relieve some of the pressure of agency borrowing and PC sales, the normal flow of bills into and out of the market was quickly restored. This occurred despite some apparent increase in the impending burden on the bill market resulting from the reduced pressures of Government financing elsewhere on the credit markets.

An important aspect of the $2\frac{1}{2}$ -fold increase in regularly issued bills should be pointed out. In the 4 years or so from the end of November 1958 through December 1962, regularly issued bills outstanding increased by \$21.8 billion. Of that amount public investors absorbed \$20.5 billion or 94 per cent, while holdings of the Federal Reserve and Government Investment Accounts increased by \$1.3

billion, or about 6 per cent. In the next 4 years, to December 1966, regular bills outstanding grew by \$12.5 billion. But of that amount public holders acquired only \$2.7 billion or 22 per cent while the official accounts absorbed \$9.8 billion, or 78 per cent. (See Chart 5; for details see Appendix Table 7.)

During the first 4-year period—November 1958–December 1962—a substantial part of the big rise in public holdings occurred in 1959, when the brunt of deficit financing was largely borne by the bill market in a tight monetary environment. But a greater part took place in 1961 and 1962, when official action was directed toward increasing the amount of liquidity in the economy in the early years of the expansion then under way.

During the second 4 years, through December 1966, the Federal Reserve System again began to increase its bill holdings as the need for “operation twist” waned. Also during this period, business corporations increasingly found other short-term investments such as commercial bank CD’s more profitable than Treasury bills, and later in the period—from mid-1965 through most of 1966—the banks found it desirable to reduce their bill holdings to meet the insatiable private demand for bank credit. From 1964 on, the Federal Reserve increasingly acquired bills in open market operations to replace gold losses and rebuild the reserves needed for the continuation of economic expansion.

However, even during the period of rapid increase in the bill holdings of official accounts, commercial banks and dealers continued to act as the major “underwriters” for new bills. The fact that the Federal Reserve found it expedient to buy more bills than coupon issues in its open market operations did not detract from the bill market’s ability to undertake the distribution of the added supply.

CASH REFUNDING

When the Treasury began in 1960 to refinance through cash subscriptions instead of rights exchanges in its quarterly refinancings,

the change in technique gave rise to a number of questions. After some 6½ years and 10 quarterly cash refundings in which \$71½ billion worth of new securities were issued, answers to a number of the questions are reasonably clear. Some of the questions are:

Is cash refinancing a complete substitute for rights refundings?

Which does a better job of restructuring the debt?

Which is more expensive for the Treasury?

How do they compare with regard to the participation and activity of the dealer market?

The following information provides some relevant comparisons:

Of the \$71½ billion issued in quarterly cash refinancings through 1966, \$35½ billion was awarded to public subscribers (other than the Federal Reserve and Government Investment Accounts). During the same period \$141 billion of new securities were issued in 16 rights refundings.² Of these, public holders received \$75 billion for an average exchange of \$4.7 billion. In the cash refinancings the average amount allotted to public subscribers was \$3.5 billion, indicating that the Treasury tended to use the exchange approach for the larger operations.

In six of the 10 cash operations only a shorter-term anchor issue was offered. In three others, two options were offered; and in one operation there were three options. The Treasury provided more options to extend maturities in the rights refundings. Of the 16 exchange operations, only two were limited to one option. In each of these cases public holdings of the maturing issues were about \$2½ billion, which was considered too small to warrant more than a single option. Of the 14 remaining rights operations, 10 provided two options and four had three options.

The average length of the issues offered in rights exchanges was 28 months as against 22 months in the cash operations. But this greatly

understates the difference in the contribution of the two types of offerings to debt extension. About \$42¾ billion in securities other than anchor options were issued in rights refundings, while some \$7¾ billion were allotted in cash subscriptions. The average length of these longer issues in rights refundings was slightly less than 60 months, or nearly 5 years, and in terms of debt extension was equal to \$42¾ billion times 5 years or \$212 billion bond-years. The average length in cash operations was 70 months, but the effective debt extension was only \$45 billion bond-years. Moreover, of these longer issues the public allotment in rights was \$35½ billion in comparison with \$6¾ billion in cash operations. Thus, rights refundings were far more effective in extending the length of those holdings that are not automatically rolled over at maturity.

One attribute of cash financings that has no counterpart in rights refundings is the Treasury's control over the amounts offered, including additional cash or planned attrition. About \$3.1 billion of new money was raised in seven of the 10 cash refundings, while in the first operation, instead of raising new cash, there was about \$660 million of planned payoff. In the other two cases, offerings just about replaced the maturing amounts without attrition or additional cash.

The variation in the allotment ratios illustrates one of the chief disadvantages of cash refinancings. The ratio of total public allotments to total public subscriptions for the 15 individual issues offered in the cash refundings ranged from 12 to 100 per cent. The 100 per cent allotment was on a small—\$365 million—issue of long-term bonds in August 1962, of which \$315 million was subscribed for and allotted to the public. In November 1965, a very cautious market environment produced an allotment ratio of 48 per cent on a single-option 18-month note. In this case many subscribers received much more than they wanted of the total \$3.2 billion awarded to the public, which contributed to a very weak secondary market in the new issue. Even without those two

² For details see Appendix Table 8.

cases, however, the variation in allotment ratios to public investors was still quite large—from 12 to about 35 per cent—with an average ratio of 21 per cent.

The cost to the Treasury in terms of “underwriting spreads” was slightly less on cash offerings than on rights refundings. These spreads are the differences between the offering rates and market yields on comparable outstanding maturities. Such spreads are needed to make the new issues more attractive than existing issues. The average spread was about 10½ basis points in the cash operations as against 11¼ basis points in the rights exchanges. This was not due to the greater proportion of longer-term issues offered in the rights refundings. There has been no discernible pattern in the spreads with respect to maturity. However, on both kinds of offerings the spreads declined substantially from early 1963 to late 1966.

The participation and activity of the dealer market in cash as compared with rights refundings showed no clear-cut differences, according to statistics on dealer activity compiled by the Federal Reserve Bank of New York. These statistics, which begin in 1961, included nine of the 10 cash refinancings and 13 of 16 rights operations through 1966. In these financings dealer activity varied widely within each type of offering, but the averages were not far apart. (See Appendix Tables 9 and 10.)

For example, awards to reporting dealers through cash subscriptions ran from about 6½ to more than 20 per cent of total allotments to the public for an average of roughly 12½ per cent. Issues to dealers in rights refundings ranged from approximately 9 to 26½ per cent of issues to the public and averaged 14½ per cent. The small difference between the two averages reflects the dealers’ willingness to participate about as much in one type of operation as in the other.

Another comparison of activity is the maximum net long position of dealers in when-issued securities in a cash refinancing and the maximum position in rights plus when-issued securities in a rights operation.

These data indicate the dealers’ degree of exposure to market risk in or immediately following a financing. Expressing the exposure in each financing as a percentage of allotments, the range in the case of cash refundings was 5 to 22 per cent of total issues to the public for an average of 11 per cent, and on the rights approach the range was from about 7 to 20½ per cent, with an 11½ per cent average. Here the difference in the two averages is negligible, indicating that the dealers were about equally willing to take risks in either type of financing.

A third index of dealer activity is the volume of trading in when-issued securities during or immediately after a financing. Data are available for nearly all of the refundings through the seventh day following the announcement of terms. Although trading in cash operations did not start until after the subscription books closed, while trading in rights refundings began immediately after the announcements, this difference in procedure is not considered significant due to the high concentration of trading in the first few days. Trading in rights, mainly accumulations by dealers prior to exchange, was excluded since that can be considered equivalent to dealer awards in cash refinancings. The volume of trading in each financing has been related to the total amount of securities issued to the public, to allow for differences in the size and in the number of refundings in the two types of operations.

The average trading volume in cash refinancings ran from 14½ to 43 per cent, but in six of the eight for which data were available, trading ranged from 21 to 32½ per cent, for an average of 26 per cent. In rights operations the range was somewhat broader—from 13½ to 31 per cent—for an average of 19½ per cent. However, the difference between the two averages is not large. One possible explanation stems from the circumstance that unsophisticated investors—the smaller banks, for example—ordinarily prefer rights refundings to cash refinancings. Guessing the probable percentage allotment in a cash operation requires a high degree of market sophistication. Even

expert appraisal is often wrong. Rather than guess incorrectly and receive possibly much more or possibly much less of the new securities than they wish to hold, many investors may prefer to acquire the exact desired amount in the secondary market.

ADVANCE REFUNDING

Scope. Between June 1960 and August 1966 the Treasury conducted 13 advance refunding operations. In magnitude a total of about \$286 billion in outstanding issues was made eligible for exchange offers, and of these about \$204 billion was in public hands. Slightly over \$69 billion, or more than one-third of public holdings, was exchanged.³ The scope of these operations can be judged from the fact that the average of the marketable coupon debt outstanding at each midyear during the 6¼-year period was about \$154 billion, of which about \$117 billion was publicly held. Thus, the advance refundings during the period represented offers to roll over some 1¾ times the marketable debt in the public's hands, with the turn-ins amounting to about 60 per cent.

These advance refundings included a veritable multiplicity of offerings with respect to rates and maturities of the eligible and offered issues. In all, more than 65 outstanding issues and about 25 newly offered issues were involved, with several of these eligible and offered issues used again in succeeding operations. The maturities of new issues offered in exchange ran from a little less than 4 years to more than 38 years, while those of outstanding eligible issues ranged from less than a month to more than 10¾ years. The percentages of public holdings of eligible issues exchanged covered a range of 8.6 to 72.2 per cent.

All of these advance refundings occurred within the peak-to-peak interest-rate cycle, spanning a period from early January 1960 to late August 1966. The offering yields on the

new issues ran from a low of 3.63 per cent in March 1961 to a high of 5.24 per cent in August 1966, while on eligible issues coupon rates ranged from 2¼ to 5 per cent.

Performance factors. With such wide variations in rates and terms, some degree of segregation of these operations into more comparable groups is necessary for analytical purposes. Thus, for most analyses the advance refundings have been grouped into three categories, two of which were described in the white paper on advance refunding released prior to the full-scale advance refunding operation of October 1960. The three categories are pre-, junior, and senior advance refundings, based on the terms to maturity of the eligible issues involved. Pre-refunding refers to the exchange of eligible issues with remaining terms to maturity of less than 1 year; junior advance refunding refers to those maturing between 1 and 5 years; and senior advance refunding to those 5 years or longer. These are arbitrary distinctions, particularly when it is found that seven of the 18 junior refunding issues had remaining terms of 1 to 1½ years, while the 32 pre-refunding issues had remaining terms ranging from ¾ of a month to 9¾ months.

For the purposes of this paper, the measure of performance in advance refundings has been based primarily on the percentage of publicly held issues exchanged. In this regard, performance is complicated by the fact that a number of the pre-refunding and junior refunding issues were made eligible in more than one advance refunding. Moreover, some eligible issues were reopened—that is, the outstanding amounts were added to—between advance refundings.

Over all, about 34 per cent of the issues publicly held that were made eligible for advance refunding in 1960–66 were exchanged, if the eligible issues are all regarded as not having been previously included in an earlier advance refunding. If such double counting is eliminated, the average proportion exchanged would be about 46 per cent.⁴ For purposes of

³ Appendix Table 11 provides detailed information on each advance refunding and the totals for 1960–66.

⁴ Based on figures in Appendix Table 11.

simplicity, however, and with the extensive changes in ownership as maturities shorten, in the analyses that follow, allowance is made for double counting only within category groups. For example, an eligible issue in a junior refunding category (1- to 5-year maturity) that was involved twice in an advance refunding without having been added to in the meantime is treated as one eligible issue merely having been offered additional options; or for some purposes the second involvement is disregarded. However, a junior refunding issue that became eligible again in the pre-refunding category (within-1-year maturity) is regarded as one not subject to a previous advance refunding. Account is also taken of additions to eligible issues between advance refundings. In the case of senior refundings none of the eligible issues involved (the World War II 2½'s) was made eligible more than once.

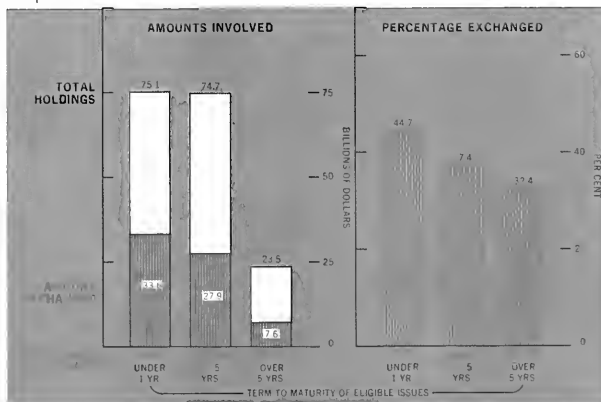
As shown in Chart 6, pre-refundings with nearly 45 per cent of eligible public holdings exchanged were the most successful category if account is taken of the same issue having been involved in more than one advance refunding. Junior refundings were the next most successful category with 37½ per cent exchanged, and senior refundings are last with 32½ per cent.

This strongly implies that the shorter the length of the eligible issue, the larger the percentage that will be exchanged. As a broad generalization that is the case.

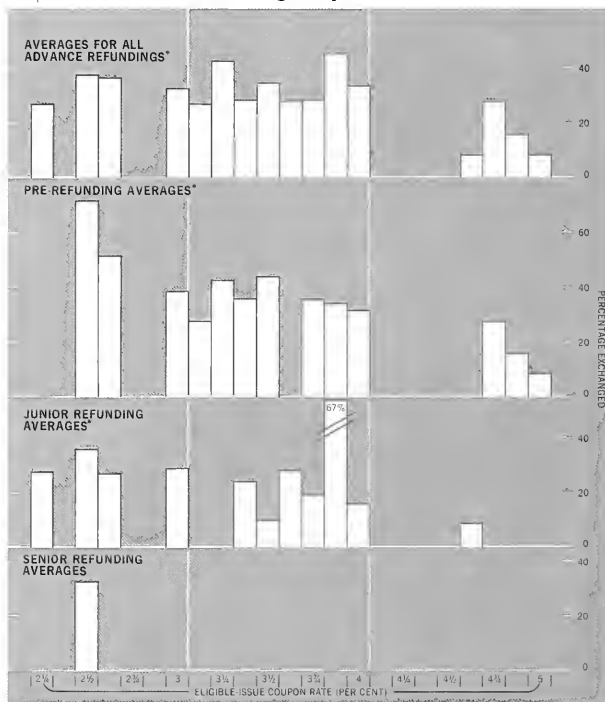
However, other factors also had a bearing on performance in advance refundings. One such factor was the coupon rate of the eligible issue. In making this comparison, the total amount exchanged of all issues of a certain coupon rate was divided by the amounts of those issues in public hands before the refundings, producing a weighted-average percentage of each coupon size exchanged. First, only the initial use of each individual issue was considered. Generally, when an issue was made eligible more than once it was closer to maturity, hence more apt to have a higher turn-in rate based on the amount remaining in public hands. Moreover, in pre-refundings many investors assumed that when the issues reached maturity, the refunding offer might include a short-term option only, or that the operation might be a cash refinancing with no right to exchange.

Chart 7 shows the relationship between coupon size and the percentage exchanged. The top tier of bars gives only a hint of any significant relationship if all of the eligible issues in-

6 | EXCHANGES OF PUBLICLY HELD ISSUES IN ADVANCE REFUNDINGS, 1960-66



7 SIZE OF ELIGIBLE-ISSUE COUPON RATES IN ADVANCE REFUNDINGS RELATED TO PERCENTAGE OF PUBLIC HOLDINGS EXCHANGED: First Offerings Only



* Excluding exchanges in later advance refundings.
NOTE.—Based on data from U.S. Treasury Dept.

volved in the advance refundings are lumped together. But when they are distributed according to the type of operation in which they were involved—pre-, junior, or senior refundings—it is fairly apparent that a rough inverse correlation exists between the size of the eligible-issue coupon rate and the percentage exchanged. The tendency is more evident in the case of pre-refundings than in junior advance refundings,² while the senior refundings show

no tendency because only one coupon size was made eligible.

On the basis of preliminary studies, the correlations in the pre- and junior refundings are not precise enough for truly predictive pur-

² The one issue clearly out of line in the junior refunding was the 3 3/4 per cent note of Feb. 15, 1965, with 67 per cent exchanged in the January

1965 advance refunding. It was barely over 1 year to maturity at the time and was held largely by banks and corporations willing to turn in their holdings for the rights value involved. In addition, dealers were more satisfied to position the notes until maturity since that eligible issue carried the second highest coupon rate in the refunding, thus reducing their carrying cost. The issue bearing the highest coupon rate, 4 per cent, was not so readily available, and relatively fewer rights were turned in to the market.

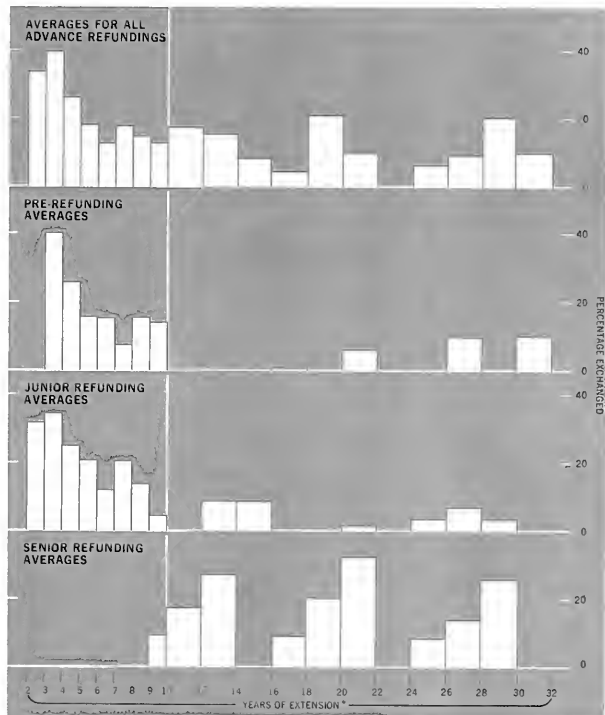
poses. Such studies of the results in advance refundings through July 1964 indicate a coefficient of correlation squared (r^2) of .565 in the case of pre-refundings and only about .243 in the case of junior operations. It is quite possible that as the number of advance refundings of all types grows and additional refinements are used, the statistics will yield more favorable results.

In those cases where the same issue was made eligible again in a later advance refunding, no pattern emerges with respect to size of coupon, mainly because there are too few ob-

servations to permit any meaningful conclusions. It is evident, however, that other factors—such as the coupon size of the offered issue, its length, and the shortness of the eligible issue's remaining term to maturity—are also significant. And of course, with only limited observations, the general monetary policy and interest-rate environment at the time of a refunding become overriding.

Another apparently important factor is the length of extension. As shown in Chart 8, the greater the extension, the smaller the percentage that is likely to be taken in pre- and junior

8 | PERCENTAGE OF ELIGIBLE ISSUES EXCHANGED RELATED TO
THE LENGTH OF EXTENSION IN ADVANCE REFUNDINGS
First Offerings Only



* From each number of years to, but not including, the next number.

NOTE.—Based on data from U.S. Treasury Dept.

refundings. In senior operations no truly significant pattern emerges except that the performance in the first senior refunding was better than in the second, and better in the second than in the third. (The terms to maturity of the eligible issues in each of the last two senior refundings were longer than those in the preceding one. Moreover, each succeeding refunding occurred later, and the offered issues were the same in each case. Therefore, the first senior refunding provided the longest extensions of the three, the second produced the next longest extensions, and the last produced the shortest extensions. The lengths of the extensions are shown in Appendix Table 11.) Here again the correlation between years of extension and percentages exchanged even in the pre- and junior operations is imprecise and cannot be used with any appreciable degree of confidence for predictive purposes.

Still another factor that logically should have had a substantial bearing on the percentage exchanged is the increase in coupon rate from the eligible to the offered issue. This, of course, has to take adjustment (boot) payments into account. As with the other factors mentioned, a very rough relationship appears to exist, but again it is imprecise and does not stand the test of correlation significance.

Preliminary studies failed to turn up any conclusive evidence that the attractiveness of the offerings in terms of the yield spread on the offered issues above the prevailing market pattern of rates had any appreciable effect on the proportion exchanged.

When measured against another variable—the size of the offered-issue coupon—the percentage taken showed an inverse relationship. However, this is not too surprising. With an upward-sloping yield curve, although gradually diminishing in slope, the longer options carried the higher coupons during most of the active advance refunding period of June 1960 to January 1965, and apparently the length of the extension was a stronger factor than the coupon size of offered issues.

An attempt to find useful relationships for the advance refundings through July 1964 in a multiple correlation study yielded no significant results primarily because the amount of data then available was too small to provide a sufficient number of degrees of freedom. It may be that as experience with advance refundings grows, the data will provide more precisely useful statistical conclusions.

Investor participation. The following analyses cover the advance refundings through 1965. The last two in 1966 were combinations of regular refundings at maturity and pre-refundings, thus precluding the investor classification of the offered issues originating from the regular as against the pre-refunding issues. This still leaves over \$62½ billion of public exchanges for analysis.⁶

The ownership pattern in those exchanges closely follows the division between the three senior refundings and the pre- and junior refundings. The senior operations included as eligible issues the World War II 2½'s and the 2½'s of September 1967–72, all with remaining terms of over 5 years. The pre- and junior refundings included all other eligible issues. (See Appendix Table 13.)

As indicated in Table 1, insurance companies and mutual savings banks together acquired 50 per cent of the \$7.6 billion in new 3½ per cent bonds in the senior refundings. In the first two senior operations these investor classes accounted for more than 58 per cent of the 3½'s taken; but in the third, they could not participate more fully because their holdings of the 2½'s eligible in that refunding had been largely depleted by conversion into non-marketable 2¾ per cent bonds in 1951 and 1952.

Pension funds of State and local governments exchanged over \$800 million of the wartime 2½'s, picking up the next largest part of the offered long-term 3½'s. Other State and local funds accounted for nearly \$650 million,

⁶ Exchanges in the 1960–65 advance refundings, by investor classes, are covered in Appendix Table 12.

TABLE 1: PUBLIC PARTICIPATION IN ADVANCE REFUNDINGS, 1960-65, BY CLASS OF INVESTOR

Investor class	Amounts exchanged (in billions of dollars) in—			Percentage distribution		
	Senior refundings	Pre- and junior refundings	Total	Senior refundings	Pre- and junior refundings	Total
Commercial banks .....	.6	32.9	33.5	8.3	59.7	53.5
Dealers and brokers .....	.4	8.2	8.6	5.2	14.9	13.7
Corporations .....	.1	1.6	1.8	1.6	3.0	2.8
Insurance companies	2.6	2.1	4.7	33.9	3.8	7.5
Mutual savings banks	1.2	1.2	2.4	16.3	2.2	3.9
Private pension funds .....	.1	.5	.6	1.7	.9	1.0
State and local:						
Pension funds .....	.8	.5	1.4	10.7	1.0	2.1
Other .....	.6	2.0	2.7	8.4	3.7	4.3
Individuals .....	.4	1.4	1.8	5.5	2.5	2.9
All other .....	.6	4.6	5.2	8.4	8.3	8.3
Total exchanged by public	7.6	55.0	62.6	100.0	100.0	100.0

NOTE.—Details may not add to totals due to rounding.

SOURCE.—*Treasury Bulletin*; bank dealers are included with commercial banks.

or about $\frac{1}{2}$ per cent. of the senior exchanges. Among other public investors, commercial banks⁷ exchanged \$630 million, acquiring $\frac{1}{4}$ per cent of the $\frac{1}{2}$'s, and individuals acquired more than \$400 million or $\frac{1}{2}$ per cent.

In the pre- and junior advance refundings commercial banks were by far the major participating class, acquiring nearly \$33 billion or 60 per cent of the offered issues. Dealers and brokers accepted \$8.2 billion or about 15 per cent of the total offerings in those refundings as against less than \$400 million or 5 per cent in the senior operations. (The dealers' role in advance refundings is more completely detailed in the section on dealer participation and activity.)

Corporations, which averaged less than 3 per cent of all exchanges, participated more fully in the first junior advance refunding, accounting for 6 per cent of the total exchanged in that refunding. While holding sizable amounts of many of the eligible issues in later refundings, corporations showed relatively little interest even in the shortest (3-year, 11-month) issue offered.

Individuals participated most heavily in the third senior refunding, in which the eligible is-

ssues included the $\frac{1}{2}$'s of June and December 1972. The amounts of these issues remaining after the 1951-52 conversions into the non-marketable $\frac{2}{3}$'s, mostly by institutional investors, were relatively heavily concentrated in individuals' holdings.

State and local pension funds, which had participated quite actively in the senior operations, did not acquire any substantial portion of the long-term bonds offered in pre- and junior refundings, mainly because they held relatively few of the eligible issues.

Table 2 shows the extent to which public investors preferred the shorter options in the 1960-65 advance refundings. However, the dollar amounts exchanged into the two maturity categories under 10 years were not very far apart in proportion to the total amount of eligible issues in each case. In fact, of the public holdings eligible for the under-5-year offered issues, 33 per cent was exchanged; and of those eligible for the 5- to 10-year issues 24 per cent was exchanged. Similarly, with respect to the two maturity groups over 10 years, 10 per cent of the total eligible for the 10- to 20-year maturities was exchanged as compared with 11 per cent of those eligible for the 20-year-and-over category.

As might have been expected, commercial banks, the largest participating class, chose under-10-year maturities for almost 90 per cent

⁷ This includes exchanges by bank dealers also. As reported to the Treasury, commercial bank allotments are not subdivided into dealer banks and other banks.

TABLE 2: MATURITY DISTRIBUTION OF ISSUES ACQUIRED BY THE PUBLIC IN ADVANCE REFUNDINGS, 1960-65, BY CLASS OF INVESTOR

In billions of dollars

Investor class	Maturity class (years)				Total
	Under 5	5 to 10	10 to 20	20 or more	
Commercial banks.....	8.9	21.0	.9	2.7	33.5
Dealers and brokers.....	1.3	3.9	.7	2.6	8.6
Corporations.....	.5	1.0	(9)	.2	1.8
Insurance companies.....	.4	1.4	.5	2.4	4.7
Mutual savings banks.....	.2	.8	.1	1.3	2.4
Private pension funds.....	.1	.3	.1	.2	.6
State and local:					
Pension funds.....	(1)	.3	.2	.9	1.4
Other.....	.4	1.4	.2	.7	2.7
Individuals.....	.2	1.0	.1	.4	1.8
All other.....	1.3	3.0	.2	.7	5.2
Total public.....	13.3	34.1	3.1	12.1	62.6
Total publicly held issues eligible for exchange %	40.7	140.2	31.9	110.5	2188.6

¹ Less than \$50 million.

² Maturity detail will add to much more than the total, as most eligible issues were exchangeable into two or more options.

NOTE.—Figures may not add to totals due to rounding.

SOURCE.—U.S. Treasury Department; bank dealers are included with commercial banks.

of their exchanges. Their takings of \$3.6 billion in the over-10-year area, three-quarters of which were 20 years or longer, partly reflected bank dealer positioning of longer issues.

Nearly 60 per cent of the issues acquired by insurance companies and mutual savings banks were over-10-year maturities, mostly in issues over 20 years. The remaining 40 per cent of insurance company and mutual savings bank acquisitions were in the under-10-year area and they reflected in part exchanges by fire and casualty insurance companies, which normally hold shorter-term issues.

State and local pension funds concentrated close to 80 per cent of their \$1.4 billion participation in the long-term area. Individuals, on the other hand, placed about 70 per cent of their \$1.8 billion participation into under-10-year maturities, despite their relatively larger holdings of the 2½'s of World War II, which were eligible for exchange only into long-term bonds.

With respect to the percentage of investor holdings of eligible issues exchanged, the data available are not wholly comparable as between holdings and allotments. Moreover, coverage is incomplete for some of the investor groups.

Commercial banks with fairly good coverage

apparently turned in about 32½ per cent of their eligible-issue holdings. Insurance companies exchanged about 42 per cent and mutual savings banks turned in about 38 per cent of their eligible holdings.

Figures for State and local funds cover only the last seven of the 1960-65 advance refundings. If the figures are comparable, the indicated turn-in rate was about 60 per cent for State and local pension funds and 21 per cent for the other funds in those operations.

Available figures for all but the first advance refunding indicate that corporations exchanged about 13 per cent of their eligible issues while private pension funds exchanged about 30 per cent. Figures on eligible issues of individuals are not available.

In summary, commercial banks and dealers accounted for over two-thirds of the offered issues taken by public subscribers in the 1960-65 advance refundings. Allotments of these issues included about \$33.5 billion to commercial banks and \$8.6 billion to dealers.

At the end of the 1960-65 advance refunding period the commercial banks surveyed by the Treasury (representing some 80 to 85 per cent of total commercial bank holdings) held \$3.2 billion fewer coupon issues than at the beginning. Moreover, their holdings in 1- to

5-year maturities declined by nearly \$13 billion over the period. This is the maturity area into which a large part of commercial bank acquisitions in the advance refundings would have shortened with the passage of time. Since they acquired almost \$30 billion of issues in the 4- to 10-year maturity area, it follows that the banks, like the dealers, were generally acting in an underwriting capacity in these operations. In addition, the mechanism for distributing these securities was through the dealer market. Thus, in large measure, the success of the advance refunding technique was due to the underwriting and distributing functions of these two groups.

Market impact. In its white paper called *Debt Management and Advance Refunding* the Treasury maintained that the impact of advance refunding on long-term interest rates would be much smaller than that of ordinary cash financing or of maturity refunding, given equal volumes of long-term debt extension in either case. The discussion in the white paper centered primarily on the contrast between the relative ease of exchanging intermediate-term issues for long-term (senior refundings) bonds on the one hand, and finding new long-term funds or issuing long-term bonds for cash or in refundings at maturity, on the other.

It was thought, in the latter case, that new cash borrowing would absorb long-term funds otherwise available for private or State and local needs and that the added supply of long Treasury bonds would exert upward pressure on interest rates generally. It was also felt that this would occur in regular refundings at maturity. By the time issues that were originally long-term reached maturity, they would be held mostly by short-term investors or as liquidity reserves by other investors, and neither of these investor groups would want long-term bonds in exchange. In that case, new long-term investment funds would be required for the purchase of the "rights" or the "when-issued" new securities in "rights" refundings at maturity, thus paralleling the effect of new long-term issues sold for cash.

In a senior advance refunding, it was

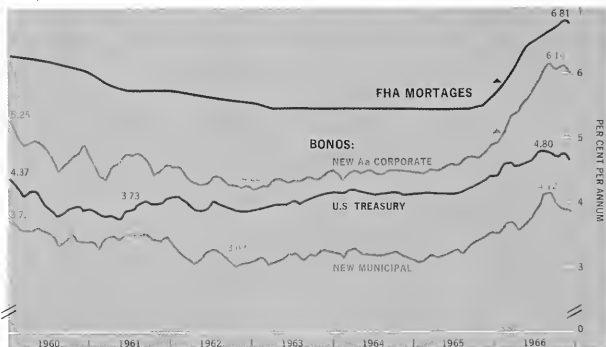
thought, long-term investors would be given the opportunity to extend their intermediate-term holdings before those securities had largely gravitated into the hands of short-term investors. In general, the inducement to extend would be provided by higher coupon rates of interest, based on the higher investment yields resulting from an upward-sloping, market-pattern-of-rates curve. Moreover, in such an exchange the injection of new long-term funds would be substantially smaller than in a regular maturity refunding, hence the upward pressure on long-term rates would be minimized.

These tenets remained generally in effect through the March 1962 combination junior-senior refunding. Thereafter, however, senior advance refunding was discontinued. First, because of congressional criticism, and second, because after all the holders of the wartime 2½'s had been given an opportunity to exchange, few alternative low coupon issues remained as candidates for senior advance refundings.

In the meantime, from the fall of 1960 to the spring of 1962, \$8.0 billion of existing publicly held issues had been extended into new long-term bonds maturing beyond 15 years. Despite this substantial volume of debt extension, yields on mortgages and on long-term corporate and municipal bonds continued to decline.

During the period that followed through January 1965, the Treasury revised its position on the circumstances under which long-term bonds might be issued in advance refundings. In most of the combination junior and pre-refundings after March 1962, the existing issues involved were made eligible for exchange into long-term bonds. Consequently, a substantial expansion in the role of the dealer market was required in the transfer of rights, in helping to underwrite the refundings, and in distributing the new issues to firm holders. Although relatively little net new money was needed, the revised procedure induced a considerable degree of market churning and a substantial amount of overhang of the new securities in the after market. Nevertheless, it was felt that these pre-

9 | YIELDS ON PUBLIC AND PRIVATE LONG-TERM ISSUES, 1960-66



▲ Revision in series.

NOTE.—Monthly averages of daily figures, except for FHA mortgages, which are secondary market yields as of the first of the month, as reported by the Federal Housing Administration. Bonds—New Aa corporate: Treasury estimates of reoffering rates; new municipals: Bond Buyer's index of 20 issues

and junior refundings would act as catalysts to reduce market hesitance and to increase activity and interest in the long-term securities in general. Thus, it was expected that the upward impact on long-term rates would continue to be small.

Expectations based on the newer concepts were fairly well realized. During the March 1962 to January 1965 period, yields on long-term Treasury issues rose 13 basis points from 4.01 to 4.14 per cent, but rates on private and municipal long-term obligations declined, as shown in Chart 9. The monthly average of new Aa corporate reoffering rates declined 1 basis point; mortgage rates in the secondary market declined 25 basis points; and yields on new municipal bonds fell about 9 basis points. (See Appendix Table 14.) During this period an additional \$6.3 billion of publicly held Treasury issues were extended beyond 15 years.

While the more prolonged effect of advance refundings on long-term Treasury yields is not readily discernible in a period of slowly rising bond yields, the immediate rate impact of such operations was clearly minimal. This is illustrated in Chart 10. After the initial jump following the announcement, long-term yields

either leveled off or declined in five of the eight refundings in which long-term bonds were issued. Also, in five of the eight cases, by the time the subscription books had been closed, long-term rates were approximately back to or were under their levels at the announcement, and they continued to be flat or to decline thereafter.

In the three refundings wherein long-term rates were slightly higher 15 market days after the announcement, the rates were up less than 5 basis points from the level before the announcement. In most cases, yields remained level for some time thereafter. Obviously, market trend comparisons cannot be carried much further in this connection, as other factors would increasingly influence the interest-rate environment soon after a refunding.

One interesting point shown in Chart 10 is that market yields remained remarkably stable for the most part from one refunding operation to another. Except for the October 1960 and the March 1963 operations, yields on long-term U.S. Treasury issues were within an 11-basis-point range immediately following the announcements.

The experience with long-term bonds issued

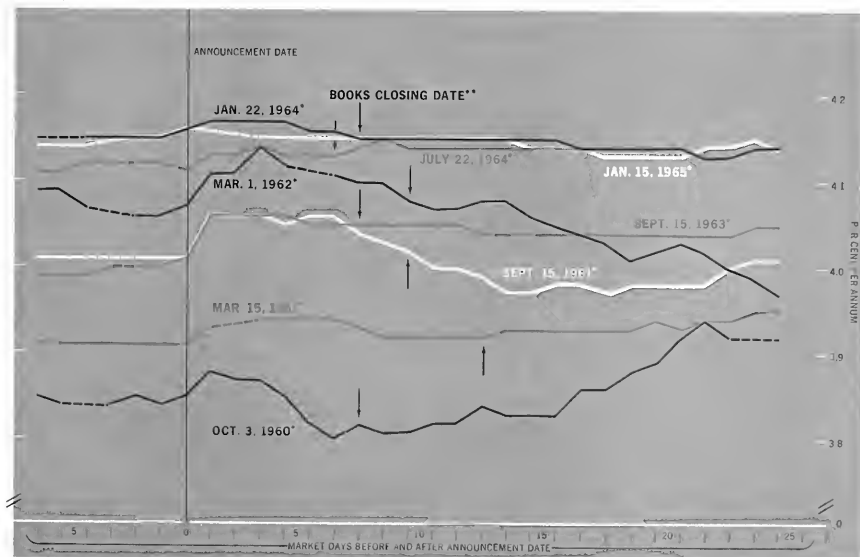
in the advance refundings through 1965 amply demonstrates that debt extension can be accomplished with relatively little impact on long-term rates. Between October 1960 and January 1965 about \$14.3 billion in publicly held eligible issues were extended into maturities ranging from nearly 17 to more than 38 years, during a period of substantial economic expansion. In fact, average market rates on mortgages and yields on corporate and municipal bonds were generally lower at the end of this period than at the beginning, while Treasury long-term rates were less than one-quarter of a percentage point higher. Only after the enlargement of the war in Vietnam in July 1965, followed by the increase in the Federal Reserve discount rate in December, did interest rates begin to rise sharply.

The accelerated rise in interest rates produced by the war and by the overheating of

the economy was not fully reflected in the increase in long-term Treasury yields because the $4\frac{1}{4}$ per cent interest ceiling brought to an abrupt halt the chance of any increase in the supply of long-term bonds. The upward pressure on Treasury yields was reflected more fully in the intermediate-term area. In response to the sharp increase in market yields, a $5\frac{1}{4}$ per cent rate on a 4-year, 9-month note was required in the combined maturity and pre-refunding operation of August 1966. During the extreme credit squeeze that followed the refunding announcement in late July, the market yield on the new $5\frac{1}{4}$'s rose to a high of $5\frac{3}{4}$ per cent on August 29.

Dealer participation and activity. Available statistics on dealer activities compiled by the Federal Reserve Bank of New York give the clear impression (Table 3) that dealer participation in the first five advance refundings

10 | LONG-TERM TREASURY YIELDS DURING RELEVANT ADVANCE REFUNDINGS



* Issue, or interest-adjustment, date.

** In the refundings of September 1961, March 1962, and March 1963, books were closed for investors other than individuals about one week earlier.

NOTE.—Based on data from U.S. Treasury Dept.

TABLE 3: ALLOTMENTS, MAXIMUM NET POSITION, AND TRADING VOLUME OF REPORTING DEALERS IN ADVANCE REFUNDINGS, 1960-65

Percentages of total public allotments

Period	Issues to dealers	Maximum position in rights plus new issues ¹	Cumulative volume of trading ²
First 5 advance refundings: June 1960-Mar. 1962....	6.9	4.8	3.9
Next 6 advance refundings: Sept. 1962-Jan. 1965....	28.0	13.4	19.3
Average.....	21.2	10.7	14.4

¹ Includes positions and trading in outstanding reopened issues.

² Through the fifth day after announcement. Includes positions and trading in outstanding reopened issues.

³ Partly estimated.

was relatively small as compared with the next six.⁸ (For details on dealer activity in advance refundings see Appendix Table 15.)

The refundings from June 1960 through March 1962 cover not only the first two senior refundings but also the only junior-senior combination and two separate junior operations. The data indicate that the dealers were some three to five times as active in the last six advance refundings as in the first five. It is not clear why the dealers remained much more aloof from the earlier junior as well as senior operations. One possible explanation is that the earlier refundings generally included low-coupon eligible issues, which made the cost of carrying the rights to the issue dates of the new securities more expensive than in the later operations. It is also possible that the generally higher coupon rates in the later advance refundings and the relative stability of longer-term yields gave the dealers a greater incentive to position the new issues.

However, even in the six later advance refundings the dealers were relatively much more heavily involved in the longer issues offered than in the shorter ones. Their turn-in rate for new under-15-year maturities ranged from about 8 to 39 per cent of the total issued to the general public while their takings of over-

⁸ The comparison excludes the 1966 maturity and pre-refunding combinations because the dealer position and trading figures on the new issues are not classified according to the eligible issues of origin. In any case, the available data suggest that most of the dealer allotments originated from the maturing issues.

15-year maturities ran from 61 to 74 per cent. As indicated in Table 4, their dollar acquisitions of under-15-year maturities totaled \$7.6 billion for an average participation rate of 21 per cent, and their over-15-year maturities were \$4.3 billion or nearly 69 per cent of all issues to the public.

Despite the lack of dealer involvement in the five earlier advance refundings, over-all public participation was quite high. Public allotments as a percentage of their holdings of eligible issues were 32 per cent in those advance refundings as against 34 per cent in the six later operations. Apparently the dealer market became an increasingly important factor in the later advance refundings. (For details see Appendix Table 16.)

TABLE 4: TOTAL ISSUES TO THE PUBLIC AND DEALER ALLOTMENTS IN ADVANCE REFUNDINGS, 1960-65

Maturities	Total issues to public (in billions of dollars)	Dealer allotments	
		In billions of dollars	As per cent of total
First 5 advance refundings:			
Maturities:			
Within 15 years.....	11.9	1.8	6.5
After 15 years.....	8.0	1.6	7.4
Next 6 advance refundings:			
Maturities:			
Within 15 years.....	36.5	7.6	21.0
After 15 years.....	6.3	4.3	68.7
Total or average.....	62.6	13.3	21.2

¹ Partly estimated.

NOTE.—Figures may not add to totals due to rounding.

Another point might be made. In the six later operations bank dealer participation was much greater relative to nonbank dealer participation than in the earlier refundings. Allotment figures published in the *Treasury Bulletin* and the statistics reported by dealers to the New York Federal Reserve Bank, which include bank dealers, indicate that the bank dealers increased their share of total dealer participation from about 18 per cent in the earlier operations to 37 per cent in the six later ones.

A comparison of dealer participation in advance refundings and in regular refundings at maturity shows that during fairly similar periods dealers were much more heavily involved

in the advance refundings. On the average, they acquired 21 per cent of total issues to the public in the advance operations through January 1965, as compared with 14½ per cent in the quarterly rights refundings from August 1961 through May 1966.

One index of dealer activity is their maximum net long position in rights plus when-issued securities, which measures the degree of their exposure to market risk. As a percentage of total public allotments, this was about the same in both types of operations. In the quarterly rights refundings during the period mentioned, dealers' maximum net positions per refunding averaged 11.3 per cent of total public allotments, as against 10.7 per cent in the advance refundings. But excluding the first five advance refundings, their maximum net positions in the other six averaged 13.4 per cent.

Another measure of dealer activity is the volume of trading in when-issued securities during or immediately after a financing. Comparable data indicate that dealers traded the new issues more actively in the advance refunding operations than in the regular quarterly refundings. Available figures on trading through the seventh day following the announcements of terms show that the accumulated volume of trading in the advance refundings was 24.8 per cent of total issues to the public as compared with 19.4 per cent in the quarterly rights operations. Excluding the first five advance refundings, the trading volume rises to 27.8 per cent of the new issues taken by all public holders.⁹

Cost of advance refunding. It is virtually impossible to quantify the "true" net extra cost or saving resulting from advance refunding. Once such a refunding has been consummated no one can know, or even guess with confidence, what would have happened without it or by attempting to accomplish the same de-

gree of debt extension in another way. But it is difficult to escape the conclusion that the issuance of long-term bonds in cash financings or through regular refundings at maturity, in the same volume as through advance refundings, would either have been impossible under the 4¼ per cent interest ceiling, or without the ceiling would have been considerably more expensive. The experience with regular financings in comparison with advance refundings in the 1960's clearly points to that conclusion.

As indicated in Table 5, the total amount of bonds of over-10-year maturities issued in the 3-year period from April 1960 through April 1963 in cash financings or regular maturity refundings was \$1.9 billion. During this period the Treasury made the last strenuous attempts to issue long-term bonds without resorting to advance refunding. It was also the period during which the bond auction was introduced and then abandoned as an impractical means of producing debt extension on a substantial scale. In these financings the Treasury issued long-term bonds on five separate occasions in amounts averaging about \$380 million per offering. (For details see Appendix Table 17.)

During a closely similar period the Treasury conducted five advance refundings in which bonds longer than 10 years were offered. The total amount extended was \$13.6 billion, and averaged about \$2.7 billion per operation. The average term to maturity of these bonds was nearly 2¾ years longer, and their interest yield was about 3 basis points (0.03 per cent) less, than on the bonds issued for cash or in regular refundings. Thus, although the two methods achieved roughly comparable degrees of debt extension at closely similar interest costs, the average amount extended per advance refunding was more than seven times as great. (For details see Appendix Table 17.)

In the remaining advance refundings the Treasury found it possible to increase the over-10-year debt by another \$4.2 billion without offering an investment yield higher than 4.25 per cent. In all, about \$17¾ billion of long-term debt was advance refunded between October 1960 and January 1965 before

⁹ For a discussion of the longer-run effect of advance refunding on dealer trading volume in the intermediate- and long-term areas of the market, see Louise Ahearn and Janice Peskin, *Market Performance as Reflected in Aggregate Indicators*, Part 2 of this series, pp. 111 and 112.

TABLE 5: ISSUES OF OVER-10-YEAR TREASURY BONDS, 1960-65

Item	Amount issued (in millions of dollars)	Average term to maturity (in years)	Average offering yield (in per cent)	Average offering yield spread ¹ (in per cent)
In cash financings and regular refundings at maturity, Apr. 1960-Apr. 1963.....	1,902	24.4	4.13	.12
In advance refundings:				
Oct. 1960-Sept. 1963.....	13,597	27.1	4.10	.11
Jan. 1964-Jan. 1965 ²	4,200	26.6	4.25	.06
Total in advance refunding.....	17,797	27.0	4.13	.10

¹ Spreads above market yields on outstanding issues of comparable maturity.

² No bonds longer than 10 years were issued in cash financings or regular refundings at maturity in this period.

the rise in interest rates during the last summer of the period effectively foreclosed the offering of issues longer than 5 years because of the 4½ per cent interest limitation on bonds.

In terms of spreads above existing market yields on comparable maturities, long-term bonds issued for cash and in regular refundings appeared to be about as attractive as those in advance refundings. The average of offering yield spreads was 12 basis points in the cash and maturity refundings and 11 basis points in the first five advance refundings.

In view of these statistics, it seems probable that regular operations on the scale of advance refundings could not have succeeded. Long-term bonds offered in two of the regular refundings during the 1960-63 period were for cash subscription. In both of these cases the allotment ratio was 100 per cent, indicating a considerable degree of unwillingness on the part of investors to subscribe for long-term issues.

It seems reasonable to infer that massive amounts of debt cannot be extended at long term through regular means, except possibly during a fairly protracted recession. Despite

the claims from time to time that Treasury debt operations have little impact on economic cycles, debt management could not comfortably ignore even the marginal procyclical effect of a large-scale absorption of long-term funds in cash financings or regular maturity refundings during a recession. Moreover, as indicated earlier, any upward pressure on interest rates, including long-term rates other than on Governments, would also be a strong procyclical influence.

As was true of long-term issues, the relative costs of advance refunding offerings in the intermediate maturity area and of similar maturities issued in regular financings appear to compare favorably. For this comparison new issues maturing in 3 through 10 years offered through cash subscription or in regular refundings were matched against similar issues offered in advance refundings.

As shown in Table 6, from May 1960 through November 1966, about \$45 billion of 3- to 10-year securities were issued at an average offering rate of 4.15 per cent with an average term of 5.6 years in regular financings. In comparison, issues of a similar term offered in

TABLE 6: TREASURY SECURITIES MATURING BETWEEN 3 AND 10 YEARS ISSUED IN 1960-66

Period	Amount issued (in billions of dollars)	Average term to maturity (in years)	Average offering yield (in per cent)	Average offering yield spread ¹ (in per cent)
In cash financings and regular refundings at maturity, May 1960-Nov. 1966.....	44.9	5.6	4.15	.10
In advance refundings, June 1960-Aug. 1966....	56.5	6.4	4.11	.11

¹ Spreads above market yields on outstanding issues of comparable maturity.

advance refundings, totaled \$56.5 billion, at an average investment yield of 4.11 per cent with an average maturity of 6.4 years. (For details see Appendix Table 18.)

In this case, the average spread of the offered yields above market rates on issues of comparable maturity was slightly more in the advance refundings than in cash financings and regular refundings. In practice, however, such spreads have not been an important factor in determining the exchange percentage in advance refundings. Moreover, the yield spreads in financings for new cash do not reflect the value of the tax-and-loan-account credit involved.

It should be noted, however, that in the case of the regular financings the debt extended was for the full term of 5.6 years while not all of the 6.4 years in advance refunding represents debt extension. In advance refunding the debt extension is reduced by the remaining terms of the eligible issues. In the case of junior advance refunding into intermediate issues this can reduce the debt extension considerably. But even with full allowance for this, the average extension on 3- to 10-year issues in the advance refundings was 5.3 years. Thus the bond-years of extension (amounts times years) in the regular financings totaled \$250 billion years; and in the advance refundings, \$299 billion years.

It would seem, therefore, that advance refunding was also successful in extending debt into the intermediate area at an interest rate that was comparable to and in fact slightly less than that in issuance for cash or in maturity refunding.

One approach toward determining the cost of advance refunding is the budget- or dollar-cost concept as shown in the report of the Senate Finance Committee hearings on advance refunding, March 14, 1962.¹⁰ In this approach it is implicitly assumed that advance

refunding is not mandatory as is the refunding of a maturing issue. Thus, the budget effect may logically be measured on the basis of waiting until an issue reaches maturity. But since the reason for offering an advance refunding in the first place is to improve the maturity structure of the marketable debt, it seems appropriate to assume that at maturity the eligible issues would have been extended to the same point of time as in the actual advance refundings.

More explicitly, the additional cost (per \$100) is the difference between the interest rate on the outstanding eligible issue and the rate on the new issue offered in exchange, acting over the remaining term of the old issue. The saving (per \$100) is the difference between the interest rate on the new issue offered in the exchange and the rate that would be required to reopen the same new issue when the remainder of the old issue reaches maturity. This difference is applied to the period from the maturity of the old issue to the maturity of the new.

The following analysis includes only those eligible issues that matured before December 1966. This not only covers about 80 per cent of all exchanges but also precludes any need to guess the interest rates required to refund the remainder of the eligible issues maturing in the future.

It is abundantly clear that by advance refunding the Treasury saved very substantially on the eligible issues maturing through 1966. This is true whether or not the $\frac{3}{4}$ per cent interest ceiling on over-5-year offerings is taken into account.

Under assumption "A" in Table 7, if the Treasury had waited and could have refunded the maturing issues into the new issues offered in the advance refundings at rates above $\frac{3}{4}$ per cent, the over-all net saving would have totaled more than \$700 million. This is the theoretical amount saved by having refunded earlier. Through 1963 the Treasury would have incurred a net loss. But as rates rose during the course of the interest-rate cycle, the net

¹⁰ U.S., Congress, Senate, Committee on Finance. *Hearings of Mar. 14 and 16, 1962, Advance Refunding and Debt Management*, 87th Cong., 2d Sess., 1962, pp. 14 and 15.

TABLE 7: ESTIMATED INTEREST COST OR SAVINGS IN ADVANCE REFUNDING OF ELIGIBLE ISSUES THAT MATURED BEFORE DECEMBER 31, 1966

In millions of dollars

Additional cost based on the difference in interest cost between the eligible and the offered issues.

Assumption A on interest saving: Saving based on difference between rate on the new security offered in the advance refunding and the market rate required to reopen the offered issue when the eligible issue reached maturity.¹

Eligible issues maturing in—	Total amount exchanged	Added cost for period to eligible-issue maturity	Saving, from eligible-issue maturity to offered-issue maturity	Saving less cost: net saving (+) or cost (—)
1961.....	4,214	74	-6	-80
1962.....	2,473	47	25	-22
1963.....	16,237	119	75	-44
1964.....	11,232	41	170	+130
1965.....	8,513	78	166	+88
1966.....	16,226	84	719	+635
Total.....	58,915	443	1,149	+706

Assumption B on interest saving: Same as assumption "A" except that when market rate required on an offered issue maturing in more than 5 years was over 4¼ per cent, the length of the new issue was limited to 5 years or was made as long as possible at 4¼ per cent. (Total amounts exchanged and additional cost are the same as above.)

Eligible issues maturing in—	Total saving and net saving or cost		Discounted values of added cost and of saving under "B"		
	Total saving	Net saving (+) or cost (—)	Added cost	Total saving	Net saving (+) or cost (—)
1961.....	-6	-80	72	-6	-78
1962.....	25	-22	45	21	-24
1963.....	75	-44	113	66	-47
1964.....	77	+37	39	68	+29
1965.....	88	+10	72	73	+1
1966.....	467	+384	79	400	+321
Total.....	726	+283	421	622	+202

¹ Market rate on offered issue plus 0.12 per cent, regardless of whether issues over 5 years would require more than 4¼ per cent.

² Discounted at 3.5 per cent; see footnote 3, Appendix Table 19

NOTE.—Figures may not add to totals due to rounding.

costs turned into net savings. With interest rates continuing to rise sharply, particularly after the increase in the Federal Reserve discount rate in December 1965, the theoretical net savings increased almost astronomically to \$635 million on the amounts that would have matured in 1966. Even if the 1966 maturities were excluded and the upsurge in interest rates during 1966 were disregarded, the Treasury would have had a theoretical net saving of about \$70 million through 1965.¹¹

However, well before the end of 1965 the interest-rate increases to 4¼ per cent or more would have precluded the issuance of maturities over 5 years. It is evident, therefore, that the figures under assumption "A" are unrealistic. At best they merely provide some measure

of the value of the debt extension that actually took place. More realistic cost or savings figures as a result of what would have happened without the advance refundings are shown under assumption "B."

For assumption "B," when market rates rose above the 4¼ per cent limit, the length of a hypothetical refunding issue was either limited to 5 years or made as long as possible at 4¼ per cent. Under this assumption the net savings would have been drastically reduced from upwards of \$700 million to about \$280 million as a result of the foreshortened terms of these hypothetical issues.¹¹

If these more realistic figures are discounted

¹¹ For cost details on each eligible issue in advance refundings maturing through 1966, see Appendix Table 19.

to the dates of the advance refundings, the savings would be discounted more than the added costs because the savings are further in the future. Nevertheless, the discounted values still produce a net over-all savings of more than \$200 million on the amounts exchanged which would have matured by the end of 1966. Thus, even under the more realistic assumption regarding the $4\frac{1}{4}$ per cent interest ceiling, the Treasury undoubtedly saved on interest cost as a result of having previously extended debt through advance refunding.

From this, it may be inferred that the Treasury over the long run is bound to benefit only if interest rates are in an ever upward trend. But that is a superficial view. The fact is that the figures in assumption "B" tend to understate the benefits of advance refunding. Not only were the amounts extended placed well beyond the need to refund them at the historically high rate levels that followed, but also there was the probability that much of the \$59 billion maturing through 1966 or later would have been refunded and most likely re-refunded one or more times. This most certainly would have added to the upward pressure on the rates for refunding the issues that did actually mature.

From a budget-cost point of view, approximately \$185 billion of marketable coupon debt came to maturity and was refunded in the regular way during the $5\frac{1}{2}$ years from mid-1961 through 1966. About \$99 billion of that amount was publicly held, of which over \$50 billion was in eligible advance refunding issues maturing through 1966. It seems reasonable to suppose that the net effect of reducing the publicly held refunding load by more than one-third should have produced some lowering of interest rates required for the regular refundings. If that lessening of the rate required is assumed to have averaged as little as 5 basis points, the budget savings based on total maturities would have been over \$90 million a year.

In summary, it seems almost certain that massive debt extension through cash financing or refunding at maturity on a scale matching

the advance refundings would have been far more expensive and would have had a much greater repercussion in the capital market, if indeed it would have been possible at all. It also appears certain that, through 1966, advance refunding produced interest savings for the Treasury, even if the early benefits of an improved debt structure are ignored. Moreover, any reasonable assumption on the interest saving involved in having reduced publicly held short-dated coupon debt—wherein frequent refinancing at escalating rates of interest would have been required—would have added considerably to the interest saved directly as a result of advance refunding.

Tax consequences of advance refunding. There have been two types of tax treatment of exchanges in advance refunding: nontaxable exchanges with the tax effect on gains or losses generally postponed; and taxable exchanges with an immediate tax effect on gains or losses.

Beginning with the July 1964 advance refunding, taxable exchange treatment has been accorded to the pre-refunding eligible issues maturing in 6 months or less. From that time until the passage of the Tax Reform Act of 1969, the Treasury decided that issues as close to maturity as 6 months should be regarded as maturing issues for tax purposes. Under such tax treatment any gain or loss was recognized immediately for tax purposes and was reportable for the year in which the exchange took place.

Advance refunding exchanges are nontaxable if so designated by the Secretary of the Treasury under the authority of Section 1037 of the Internal Revenue Code as amended in September 1959. As defined in the code, any gain or loss in such an exchange is not recognized for tax purposes at the time of the exchange but instead is postponed until the new securities received by the taxpayer are sold, redeemed, or otherwise disposed of, whichever comes first. As originally prescribed, the designation of an exchange as nontaxable was not permissive; it had to be treated as such by all taxpayers.

In a nontaxable exchange, any subsequent gain or loss upon the sale, redemption, or other disposal of the new issues is a capital gain to a taxpayer unless the securities are stock in trade, as in the case of dealers. The holding period that determines whether the capital gain is short or long term is measured from the purchase date of the eligible issue turned in by the taxpayer to the disposal date of the new issue offered in the exchange. If the period of holding is greater than 6 months, any gain (or loss) is a long-term capital gain (or loss).

To commercial banks—and also to mutual savings banks and savings and loan associations—losses in excess of gains in a given year on coupon issues, whether acquired in advance refundings or otherwise, were considered to be ordinary losses for tax purposes, while gains in excess of losses were capital gains. (Gains on securities acquired after July 11, 1969, by banks and savings and loan associations are treated as ordinary income in symmetry with losses or ordinary losses.) Thus, until the passage of the Tax Reform Act of 1969, commercial banks tended to segregate gains in one year and losses in another in order to take greater advantage of the unsymmetrical tax treatment of gains and losses on coupon securities. This practice was confined mostly to their holdings of Governments (and municipal bonds). Advance refunding allowed considerable latitude in this regard during the term to maturity of the offered issues.

The September 1959 Act covering nonrecognition of gains or losses in advance refundings also amended the code with respect to the cost basis of the eligible and offered issues. In a par-for-par exchange, without adjustment (boot) payments, the cost basis of the eligible (old) issue becomes the cost basis of the new issue received by the investor. However, when an adjustment payment is made *by the investor* to the Treasury, the boot is invariably *added* to the cost basis of the old issue to determine the basis of the new issue.

When boot is paid *by the Treasury* to the investor, the payment is ordinarily subtracted

from the cost basis of the old issue to determine the basis of the new issue. But this procedure holds only if the *total value received* by the investor in the exchange is less than the cost basis of his old issue. This is determined by comparing the sum of the boot received by the investor and the fair market value of the new issue at the time of exchange with the cost basis of the old issue. If the sum of the boot plus the new-issue value exceeds the old-issue basis, the excess is recognized immediately. But in no case can the amount recognized be greater than the amount of the boot received by the taxpayer. (For examples of the tax treatment of boot see p. 74.)

The tax consequences of boot in advance refunding can be quite complex. One generalization that may be made, however, is that boot paid to a taxpayer by the Treasury improves his yield after tax as compared with providing the same investment yield on the offered issue before tax, but without boot. Boot paid by a taxpayer to the Treasury has the opposite effect.

As a fairly simple illustration, let us assume that a 5-year, 3 per cent existing issue currently priced in the market at 96.20 (decimal price, yield about 3.84 per cent) is made eligible for exchange into a 25-year, 4 per cent bond without boot. Based on the price of the eligible issue, the offering investment yield before tax on the 25-year 4's would be 4.25 per cent. Given these assumptions, the "minimum reinvestment rate" before tax for the 20-year extension would be 4.41 per cent. This is the minimum rate at which an investor who elects not to exchange would have to reinvest the proceeds of his 3 per cent issue when it matures, in order to equal the return on the 4 per cent bond, had he accepted the exchange offer.¹²

Table 8 shows the effect of tax on the offering investment yield and the reinvestment rate if boot is used to equate the terms of the ex-

¹² For a fuller explanation of the reinvestment rate see excerpt from the advance refunding offer of Feb. 20, 1963, which is shown on p. 75.

TABLE 8: TAX EFFECT OF BOOT PAYMENTS ON INVESTMENT YIELD AND REINVESTMENT RATE

Assumptions: The tax rate is 48 per cent (the corporate marginal rate) on the coupon income and 25 per cent on long-term capital gain. The taxpayer is a nonbank corporation. The cost basis of the 5-year, 3 per cent issue outstanding is 98 per \$100; and its current market price is 96.20. The exchange is nontaxable.

Coupon rate (per cent) on 25-year bond	Boot paid to taxpayer (in dollars per \$100 face amount)	Investment yield ¹ (in per cent)			Reinvestment rate (in per cent)	
		Before tax	After tax	Taxable equivalent ²	Before tax	Taxable equivalent ²
3½.....	+1.91	4.25	2.21	4.24	4.41	4.40
4.....	0	4.25	2.19	4.20	4.41	4.35
4½.....	-1.91	4.25	2.17	4.17	4.41	4.30

¹ To maturity date of the new.

² On a hypothetical issue at par.

change (before tax) when the coupon rate is reduced or increased by ½ per cent. In this case the boot equates the terms of the exchange using a 3½ per cent or a 4½ per cent coupon rate instead of 4 per cent.

The advantage to the taxpayer of receiving a boot payment clearly shows up in the figures. On the 3½ per cent bond, providing the same yield as the 4 per cent before tax, the after-tax yield is greater by 2 basis points, and the taxable equivalent rate on a hypothetical par issue is greater by about 4 basis points. The minimum reinvestment rate for the extension is better by 5 basis points. These earning rates are correspondingly lower on the 4½ per cent bond with boot paid by the taxpayer.

This effect of boot on the after-tax yield is due to the difference in tax treatment between boot payments and coupon income. The coupon is subject to the full ordinary income tax rate, while the cash payment of boot is considered a change in capital value.

The payment of boot to, or by, the investor is a substitute for a decrease or an increase in the offered coupon rate. Thus, when boot is received by the taxpayer in compensation for a smaller coupon rate than he would otherwise be entitled to, the effect is the conversion of a fraction of what would have been ordinary income into capital gain. When boot is paid by the taxpayer the effect is opposite and he pays ordinary income tax rates on the small additional part of his coupon income that his boot has paid for.

There is little evidence to indicate that taxable investors have been greatly influenced by the effect of boot payments. It is a fact, however, that the Treasury has paid out considerably more boot than it has received in its nontaxable advance refundings. On more than \$57½ billion of eligible issues exchanged in those refundings, boot *paid to public holders* totaled about \$231 million as against \$77 million *paid by public investors* to the Treasury. (For details see Appendix Table 20.)

A conservative, rough estimate indicates that upwards of 90 per cent of these boot payments were made to, or by, taxable investors. It seems clear that the Treasury has provided a tax boon to those investors, even if the offered issues are not held to maturity. In addition to the advantage of capital gains treatment on the boot received, in many cases taxpayers are provided free use of the capital gains tax during the postponement of recognition.

From this, the obvious conclusion is that, on equity grounds, boot should be reduced to the barest minimum needed to equate the terms of exchange in advance refundings involving more than one eligible issue. Furthermore, the eligible issues should be chosen with this in mind.

PARTICIPATION CERTIFICATES

Opinions have differed sharply on the "true" nature of participation certificates. The economic, accounting, and statistical aspects of

the problem helped to trigger a major study of budget concepts and practice, while the political problems and implications sharply divided the Congress on the subject.

At the time of the controversy proponents of the sale of PC's believed that, as shares in the principal and interest income of an irrevocably pledged pool of loans, the practice represents the sale of assets. They claimed also that under the PC procedures the costs of credit programs to the Federal Government are more truly reflected than if the programs were financed through Treasury advances to agencies at rates below Treasury borrowing costs. Moreover, they said that PC's provide a means for attracting private funds into the credit areas represented by the pool of loans at less cost than afforded by other alternatives. They pointed out that the cost of selling PC's was less than the cost of selling assets directly, even in those cases in which the Federal Government retains full servicing responsibility and provides a full guarantee.

Those on the other side felt strongly that a PC is a somewhat thinly disguised device for selling another debt instrument. Attracting new funds into fully guaranteed PC's free of servicing costs merely proves that the attraction is indeed a Government security. Moreover, all of the improvements in their terms and conditions since early 1967 to enhance marketability made the PC's resemble direct debt obligations more and more and to resemble sales of assets less and less.

As a matter of fact, that aspect of PC's did not become a significant problem until after the advent of the FNMA-type offerings in November 1964. Before that such instruments had been sold by the CCC for many years without repercussions, while the early Eximbank PC's, which date back to May 1962, had also been distributed without fanfare, although it should be noted they were sold to a rather select group of commercial banks. Other PC's had been sold in the process of liquidating the RFC.

The FNMA offerings of PC's, which began in November 1964, followed legislation em-

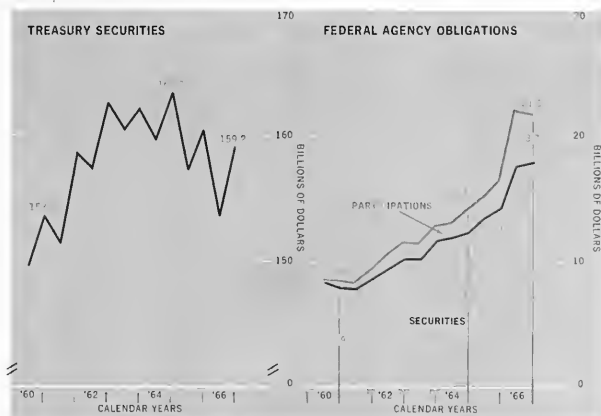
powering FNMA to act as trustee for pooling Federal-agency-held mortgages. Although these offerings started during a period of slowly rising market yields on Treasury and Federal agency securities, the major impact of issuing PC's came in 1966 after the escalation of the war in Vietnam in mid-1965, and after the increase in the discount rate in December of that year. Increased sales of PC's had been forecast in the budget for fiscal year 1966, with a substantially larger increase in fiscal year 1967.

During the December 1964-June 1966 period, PC's held by the public more than doubled, from \$2.0 billion to nearly \$4.4 billion. In the same period, public borrowing by Federal credit agencies also expanded sharply. In fact, during the 1½ years from December 1964 through June 1966, Federal agency debt held by the public increased from \$12.1 billion to \$17.6 billion, at roughly 3½ times the annual rate of increase in the preceding 4 years.

To a considerable extent, the expansion of Federal agency borrowing resulted from a growing demand for credit generally. Commercial banks and other lending institutions, facing heavy borrowing requirements in a tightening money and credit market environment, began to ration credit and choose among borrowers. Unsatisfied borrowers, including farmers and small businessmen, turned to the Federal agencies to meet credit needs ordinarily supplied by the private institutions. In addition, the tightening situation produced a sharp reduction in the supply of mortgage money. The savings and loan associations experienced particularly heavy withdrawals of funds, for reinvestment at higher rates of return in marketable instruments. As a result, the associations increased their borrowing from the Federal home loan banks. At the same time FNMA increased its purchases of mortgages in an attempt to support the secondary market.

Faced with expanded credit demands, these Federal agencies sharply increased their market borrowing. Also during this period the increased demand for bank credit for business loans and other private needs, plus the burgeoning corporate and municipal long-term

11 PUBLIC HOLDINGS OF MARKETABLE TREASURY AND FEDERAL AGENCY OBLIGATIONS



NOTE.—Data are for June 30 and December 31. Participations are those of the Commodity Credit Corporation, Export-Import Bank, and Federal National Mortgage Association. Based on data from U.S. Treasury Dept.

borrowing, added to the burden on the credit markets. Moreover, the expanded role of PC's envisaged in the Participation Sales Act of May 1966 and stated in the budget for the fiscal year 1967 added to heightened expectations of still tighter markets and higher rates.

As a result, a near-crisis atmosphere developed in the extremely tightened environment of July and August 1966, and interest rates generally reached the highest levels in 40 years or more. Although the \$9.7 billion reduction in public holdings of marketable Treasury debt from the end of 1964 through mid-1966, as shown in Chart 11, more than offset the stepped-up net borrowing by Federal agencies plus increases in outstanding PC's, it was apparently not enough to enable lenders to meet the soaring demands from private borrowers.

The market rate on 1-year Federal agency issues reached a peak of close to 6½ per cent on August 30, 1966; the 5-year rate rose above 6½ per cent; and the rate in the 10-year area increased to more than 5½ per cent. At the same time Treasury rates had also risen swiftly and by the end of August had sharply cut the yield spreads between Treasury and

agency issue rates from the peak spreads in late June and early July. Those spreads occurred when expectations of higher agency and PC rates were at full tide.¹³ At times market yields on agency issues in the 10-year maturity area were nearly as high as reoffering rates on new Aa corporate bonds without deferred call protection. (See Chart 12.) Yields on outstanding PC's were generally higher than agency yields during 1966.

In this situation the steps taken by the administration in early September 1966 to allay apprehensions and to ease the pressures on the credit markets were directed mainly toward diminishing Federal agency borrowing and PC sales. On September 8, in addition to other fiscal measures, the President called for the curtailment of public borrowing by the Federal agencies, and the next day the Treasury announced that scheduled sales of PC's would be postponed until the credit markets improved and that any new borrowing for agency needs

¹³ For market yields on agency and Treasury issues and differentials, at constant maturities, see Appendix Table 21.

TABLE 9: EXPORT-IMPORT BANK PC OFFERINGS, RATES, AND SPREADS, 1962-66¹

Issue date	Amount (in millions of dollars)	Term to earliest redemption (in years and months)	Interest cost to Eximbank (in per cent)	Cost spread (in per cent) above—		
				Federal agency market yields ²	Treasury market yields ²	Commercial bank prime rate
May 1962.....	300	2-6	4.25	.72	.93	.25
May 1963.....	250	2-6	4.00	.50	.64	— .50
Apr. 1964.....	372	2-6	4.50	.22	.34	0
Nov. 1964.....	450	2-6	4.50	.37	.50	0
Feb. 1966.....	365	1-6	5.50	.29	.49	.50
June 1966.....	396	1-3½	5.60	.20	.67	.10

¹ Excluding rollover of \$107 million of the April 1964 issue turned in for redemption in October 1966.

² At Eximbank PC terms to earliest redemption date at holder's option.

³ Including commission of \$1.25 per \$1,000.

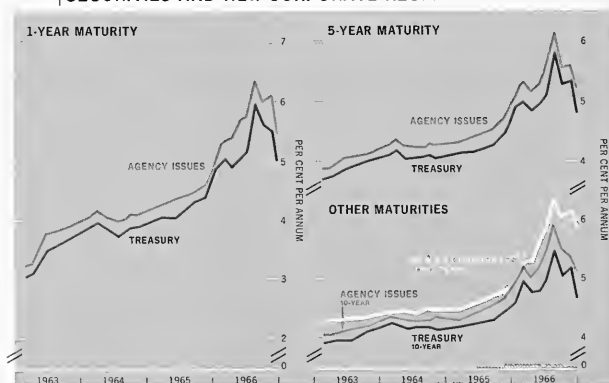
in excess of maturities would be absorbed by the Government Investment Accounts.

As a result of these measures, market fears were calmed, the tightness was eased, and interest rates quickly receded from the near-crisis peaks. By December 1966 the situation had improved enough to permit the announcement of a new PC offering.

The evolution of the type of PC's offered after 1966, aside from the short-term CCC offerings, began in May 1962 with the introduction of the Eximbank-type PC's. The market features of these PC's were thought to make them comparable with prime rate bank loans, as much as with Federal agency issues.

Some of the terms and conditions of the Eximbank PC's sold before 1967 tended to reduce their comparability with agency issues. The principal amounts of the PC's were subject to semiannual amortization generally in conformity with the loans in the pool. Their negotiability was quite limited, and to compensate for the lack of liquidity, holders were given the option (the Eximbank also) of redeeming the PC's in part or in full on each interest payment date beginning 2½ years from the date of issue. The redemption option time was reduced to 18 and 15½ months, respectively, on the last two issues, primarily to make them easier to sell. The full term to maturity

12 | MARKET YIELDS ON FEDERAL AGENCY AND TREASURY SECURITIES AND NEW CORPORATE REOFFERING RATES*



* Figures are for selected dates.

** New Aa corporate rates are Treasury estimates of reoffering rates.

NOTE.—Based on data from U.S. Treasury Dept.

was 10 years on the first PC's, but this was reduced to 7 years thereafter.

About \$2.1 billion of these Eximbank PC's were issued but by December 1966 about \$1.0 billion had been retired, mostly through the exercise of the redemption option. The Eximbank-type PC's were relatively expensive instruments as indicated in Table 9.

As a new, untried instrument the Eximbank PC's started with a fairly high yield spread above market rates on Federal agency issues and even above the commercial bank rate. In later offerings, the spreads above agency issue rates declined, partly as a result of a somewhat improved customer reception, but mainly due to mounting upward rate pressures in the agency market. Comparisons with the prime rate do not indicate a close relationship, mainly because the prime rate was held at artificial levels, with compensating balances providing the finer tuning needed for rate flexibility.

Attempts to raise target amounts through Eximbank offerings in 1966 proved unsuccessful. As a result, beginning in 1967 the terms and conditions of Eximbank PC's were changed to conform with the newest FNMA-type PC's.

In contrast to the Eximbank PC's the first three offerings of FNMA PC's were fairly well received at rates generally in line with yields on existing agency issues. This occurred despite the underwriters' dislike of some features such as small serial maturities extending over a 10- to 15-year period and the availability of the obligations only in registered form. More-

over, in the belief of some lawyers specializing in bond counseling, there was a definite need for an opinion from the Attorney General that Treasury funds, if required, would be guaranteed to meet interest and principal payments.

As indicated in Table 10, the interests costs on the first three PC's averaged between 7 and 9 basis points above comparable agency issue yields and between $\frac{1}{4}$ and $\frac{3}{8}$ per cent above Treasury yields. These spreads seemed to be quite reasonable in view of the newness of the offered instruments. However, the two offerings in the first half of 1966 were relatively much more expensive in the rapidly rising interest-rate environment at the time.

It should be mentioned that the comparison of PC costs with yields on outstanding agency issues depended on the validity of dealers' quotations in the agency market. If it can be argued that dealers' quotations were not much further out of line with "true" market values at any one time than at another, the changes in the spreads are a reasonable index of relative additional costs needed to ensure market acceptance. In 1965-66 the spreads above Treasury rates on the parts of PC offerings maturing after 5 years reflected the lack of any possible increase in the supply of over-5-year Treasury issues in the immediate future.

The first FNMA PC's following the postponement of scheduled offerings by the Secretary of the Treasury in September 1966 carried revised terms and conditions strongly recommended by market professionals during the summer. In the improved market environment at the end of the year, the average inter-

TABLE 10: FNMA PC OFFERINGS, RATES, AND SPREADS, 1964-66¹

Issue date	Total amount (in millions of dollars)	Number of maturities	Average term (in years)	Average interest cost (in per cent)	Average cost spread (in per cent) above—	
					Federal agency market yields	Treasury market yields
Nov. 1964	300	10	5.5	4.37	.08	.25
July 1965	525	15	8.0	4.54	.09	.35
Dec. 1965	375	15	8.0	4.76	.07	.31
Apr. 1966	410	15	9.3	5.44	.26	.55
June 1966	530	8	6.7	5.57	.28	.72
Jan. 1967 ²	600	3	11.2	5.25	.09	.57

¹ Including the January 1967 offering announced on Dec. 19, 1966.

² Public portion of offering; in addition, \$500 million was taken by Government Investment Accounts.

est-cost spread above Federal agency rates on the new PC's was in conformance with the pre-1966 levels. However, the average spreads above Treasury yields remained large, reflecting the continuing substantial yield differentials between Treasury and agency issues.

In summary, the FNMA-type PC's, particularly the models following the September 1966 postponement, appeared to have earned a place in the roster of regular agency issues. To that extent, the nature of PC's as viewed by the market at the time was resolved.

IV. APPENDIX

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APPENDIX TABLE 1
MONTHLY AVERAGE RATES¹ ON 91- AND 182-DAY TREASURY BILLS IN THE
WEEKLY AUCTIONS, NOVEMBER 1958-DECEMBER 1966

Per cent per annum

Auction month	3-month	6-month	Spread	3-month	6-month	Spread	3-month	6-month	Spread	3-month	6-month	Spread
	1958											
Nov.....	2.756											
Dec.....	2.814	3.065	.251									
	1959			1961			1963			1965		
Jan.....	2.837	3.097	.260	2.302	2.496	.194	2.914	2.962	.048	3.828	3.944	.116
Feb.....	2.712	3.166	.454	2.408	2.601	.193	2.916	2.970	.054	3.929	4.003	.074
Mar.....	2.852	3.159	.307	2.420	2.591	.171	2.897	2.950	.053	3.942	4.003	.061
Apr.....	2.960	3.277	.317	2.327	2.493	.166	2.909	2.988	.079	3.932	3.992	.060
May.....	2.851	3.368	.517	2.288	2.436	.148	2.920	3.006	.086	3.895	3.950	.055
June.....	3.247	3.531	.284	2.359	2.546	.187	2.995	3.078	.083	3.810	3.872	.062
July.....	3.243	3.885	.642	2.268	2.457	.189	3.143	3.272	.129	3.831	3.887	.056
Aug.....	3.358	3.840	.482	2.402	2.670	.268	3.320	3.437	.117	3.836	3.938	.102
Sept.....	3.998	4.626	.628	2.304	2.689	.385	3.379	3.494	.115	3.912	4.050	.138
Oct.....	4.117	4.646	.529	2.350	2.702	.352	3.453	3.573	.120	4.032	4.197	.165
Nov.....	4.209	4.385	.376	2.458	2.686	.228	3.522	3.648	.126	4.082	4.238	.156
Dec.....	4.572	4.915	.343	2.617	2.875	.258	3.523	3.667	.144	4.362	4.523	.161
	1960			1962			1964			1966		
Jan.....	4.436	4.840	.404	2.746	2.965	.219	3.529	3.652	.123	4.596	4.731	.135
Feb.....	3.954	4.321	.367	2.752	2.955	.203	3.532	3.664	.132	4.670	4.820	.150
Mar.....	3.439	3.693	.254	2.719	2.883	.164	3.553	3.740	.187	4.626	4.825	.199
Apr.....	3.244	3.548	.304	2.735	2.838	.103	3.484	3.676	.192	4.611	4.742	.131
May.....	3.392	3.684	.292	2.694	2.789	.095	3.482	3.612	.130	4.642	4.814	.172
June.....	2.641	2.909	.268	2.719	2.804	.085	3.478	3.572	.094	4.539	4.696	.157
July.....	2.396	2.826	.430	2.945	3.085	.140	3.479	3.566	.087	4.855	4.982	.127
Aug.....	2.286	2.574	.288	2.837	3.005	.168	3.506	3.618	.112	4.932	5.189	.257
Sept.....	2.489	2.803	.314	2.792	2.947	.155	3.527	3.666	.139	5.356	5.798	.442
Oct.....	3.426	2.845	.419	2.751	2.859	.108	3.575	3.729	.154	5.387	5.652	.265
Nov.....	2.384	2.650	.266	2.803	2.875	.072	3.624	3.794	.170	5.344	5.604	.260
Dec.....	2.272	2.530	.258	2.856	2.908	.052	3.856	3.971	.115	5.007	5.108	.101

¹Bank discount rates

²3-week average.

APPENDIX TABLE 2
91-DAY TREASURY BILLS—QUARTERLY AVERAGES OF AUCTION RESULTS, 1958-66

Period	Total tenders		Coverage ratio	Bids					Discount rates and spreads		
	Accepted	Received		Non-competitive	Competitive				Average rate	High to low	Average to high
					Nonbank dealers		Others				
					Received	Accepted	Received	Accepted			
	In millions of dollars		In per cent		In millions of dollars				In per cent		
1958— I	1,724	2,510	146	337	n.a.	n.a.	n.a.	n.a.	1.896	.094	.024
II	1,701	2,522	148	264	"	"	"	"	1.020	.103	.021
III	1,746	2,528	145	276	"	"	"	"	1.653	.108	.035
IV	1,755	2,707	154	298	"	"	"	"	2.788	.089	.021
1959— I	1,431	2,301	161	261	"	"	"	"	2.803	.114	.017
II	1,101	1,968	179	223	"	"	"	"	3.014	.065	.019
III	1,139	1,865	164	223	"	"	"	"	3.511	.136	.065
IV	1,136	1,900	167	235	"	"	"	"	4.306	.108	.044
1960— I	1,139	1,909	168	248	528	226	1,133	665	3.904	.104	.050
II	1,123	1,817	161	211	566	288	1,030	624	3.057	.133	.065
III	1,047	1,843	176	206	569	232	1,067	609	2.393	.067	.030
IV	1,047	1,873	179	214	591	220	1,069	613	2.354	.050	.039
1961— I	1,076	1,959	182	215	585	231	1,159	630	2.380	.056	.019
II	1,093	2,016	185	203	647	254	1,166	636	3.227	.044	.017
III	1,101	1,962	178	218	621	250	1,123	633	2.331	.053	.020
IV	1,109	2,073	187	221	660	251	1,192	637	2.473	.042	.014
1962— I	1,170	2,182	187	214	610	191	1,358	765	2.738	.042	.014
II	1,247	2,296	184	208	672	244	1,416	795	2.714	.034	.011
III	1,301	2,190	168	240	644	272	1,306	789	2.856	.043	.014
IV	1,301	2,198	169	249	659	283	1,290	769	2.803	.033	.010
1963— I	1,301	2,169	167	256	608	243	1,305	802	2.910	.038	.010
II	1,301	2,177	167	238	632	303	1,307	760	2.940	.028	.007
III	1,301	2,127	164	254	591	288	1,282	759	3.284	.042	.019
IV	1,285	2,102	164	254	651	324	1,197	707	3.495	.030	.009
1964— I	1,286	2,271	177	250	619	310	1,402	727	3.537	.024	.007
II	1,216	2,108	173	230	590	279	1,287	709	3.482	.024	.009
III	1,224	2,105	172	244	559	230	1,302	749	3.502	.029	.009
IV	1,223	2,146	175	246	576	231	1,324	747	3.689	.034	.014
1965— I	1,186	2,192	185	248	522	180	1,423	757	3.901	.024	.009
II	1,201	2,149	179	240	503	181	1,407	780	3.873	.022	.008
III	1,201	2,087	174	260	485	198	1,342	743	3.867	.031	.013
IV	1,201	2,048	171	254	495	232	1,299	715	4.175	.048	.016
1966— I	1,302	2,237	172	264	538	254	1,434	784	4.630	.037	.015
II	1,301	2,159	166	249	519	234	1,391	817	4.593	.041	.016
III	1,301	2,200	169	260	488	214	1,451	827	5.071	.095	.041
IV	1,302	2,277	175	266	563	267	1,448	769	5.228	.056	.021

n.a., Not available.

APPENDIX TABLE 3
182-DAY TREASURY BILLS—QUARTERLY AVERAGES OF AUCTION RESULTS, 1958-66

Period	Total tenders		Coverage ratio	Non-competitive	Bids				Discount rates and spreads		
	Accepted	Received			Competitive				Average rate	High to low	Average to high
					Nonbank dealers		Others				
					Received	Accepted	Received	Accepted			
	In millions of dollars	In per cent		In millions of dollars				In per cent			
1958—I											
II											
III											
IV	400	890	222	39	n.a.	n.a.	n.a.	n.a.	3.065	.031	.010
1959—I	400	750	188	26	"	"	"	"	3.137	.095	.026
II	423	825	195	27	"	"	"	"	3.383	.056	.018
III	408	807	198	43	"	"	"	"	4.099	.089	.038
IV	429	763	178	50	"	"	"	"	4.724	.076	.038
1960—I	400	842	210	60	258	72	525	268	4.239	.050	.020
II	470	831	177	43	267	121	520	305	3.344	.091	.040
III	478	986	206	45	310	91	631	341	2.740	.045	.014
IV	470	1,043	222	48	355	93	640	329	2.664	.045	.013
1961—I	492	1,058	215	46	319	62	693	384	2.565	.041	.013
II	485	1,051	219	46	343	78	662	361	2.496	.032	.010
III	569	1,069	188	42	337	129	690	398	2.609	.038	.015
IV	593	1,197	202	54	359	114	784	425	2.749	.030	.011
1962—I	600	1,192	199	51	364	115	777	434	2.930	.030	.013
II	631	1,292	205	52	438	155	802	424	2.809	.022	.007
III	701	1,354	197	58	392	116	934	527	3.012	.032	.012
IV	747	1,469	198	61	448	166	960	520	2.880	.021	.006
1963—I	800	1,353	169	55	408	189	890	556	2.961	.029	.010
II	801	1,527	191	58	452	178	1,017	565	3.023	.017	.005
III	800	1,396	174	57	462	223	877	520	3.404	.032	.016
IV	800	1,435	179	67	467	200	901	533	3.625	.027	.010
1964—I	862	1,716	199	64	562	239	1,089	559	3.683	.020	.006
II	901	1,695	188	65	599	345	1,629	490	3.624	.018	.006
III	901	1,621	180	64	515	264	1,033	573	3.613	.023	.009
IV	987	1,841	187	84	613	311	1,145	593	3.834	.025	.010
1965—I	1,002	2,218	221	96	293	354	1,328	551	3.984	.014	.004
II	1,001	2,030	203	99	675	310	1,256	592	3.929	.013	.005
III	1,001	1,806	180	97	544	278	1,165	626	3.970	.022	.008
IV	1,001	2,046	204	124	578	270	1,345	608	4.335	.024	.009
1966—I	1,001	2,033	203	124	613	286	1,296	591	4.791	.023	.014
II	1,000	2,046	205	130	665	299	1,250	570	4.746	.026	.012
III	1,001	2,056	205	138	568	271	1,350	592	5.359	.062	.028
IV	1,001	2,186	218	761	704	295	1,643	545	5.428	.033	.011

n.a. Not available.

APPENDIX TABLE 4
AUCTION RESULTS ON 1-YEAR TREASURY BILLS, QUARTERLY OR MONTHLY, 1959-66

Issue date	Maturity date	Subscriptions			Allotments to—				Discount rates and spreads		
		Total	Accepted	Coverage ratio	Coml. banks	Nonbank dealers	Other public	Official accounts ¹	Average rate	High to low	Average to high
		In millions of dollars	In per cent		In millions of dollars				In per cent		
Quarterly											
4/1/59	1/15/60	3,445	±2,006	172	n.a.	n.a.	n.a.	n.a.	3.386	.186	.050
5/11/59	4/15/60	3,461	±2,003	173	1,952	1	50	...	3.835	.125	.030
7/15/59	7/15/60	3,173	±2,001	159	1,981	(²)	20	...	4.728	.472	.092
12/2/59	10/17/60	3,965	±2,004	198	1,982	1	24	...	4.860	.207	.033
1/15/60	1/15/61	2,303	1,504	153	567	294	525	118	5.067	.160	.083
4/15/60	4/15/61	2,857	2,001	143	1,069	402	295	235	4.608	.302	.132
7/15/60	7/15/61	3,036	1,501	202	612	290	363	236	3.265	.074	.024
10/17/60	10/16/61	3,302	1,502	220	723	334	363	82	3.131	.075	.019
1/15/61	1/15/62	4,078	1,502	205	651	406	242	203	2.679	.055	.021
4/15/61	4/15/62	4,116	2,000	206	896	448	330	326	2.827	.054	.017
7/15/61	7/15/62	4,174	2,004	207	917	536	476	75	2.908	.061	.012
10/16/61	10/15/62	3,757	2,003	187	939	667	286	111	2.975	.058	.013
1/15/62	1/15/63	3,651	2,001	182	1,078	404	302	217	3.366	.041	.015
4/15/62	4/15/63	3,454	2,001	173	925	506	407	163	2.943	.039	.014
7/15/62	7/15/63	3,722	2,004	186	952	379	629	44	3.257	.048	.016
10/15/62	10/15/63	4,535	2,500	181	1,209	574	437	280	2.969	.039	.010
1/15/63	1/15/64	5,244	2,496	210	1,331	516	587	62	3.015	.020	.005
4/15/63	4/15/64	4,048	2,501	162	1,192	628	569	112	3.062	.018	.006
7/15/63	7/15/64	4,495	1,998	225	844	538	593	23	3.582	.069	.016
Monthly											
9/3/63	8/31/64	2,632	1,001	263	364	543	87	7	3.575	.019	.004
10/1/63	9/30/64	2,395	1,002	239	387	461	139	15	3.586	.022	.006
11/4/63	10/31/64	1,891	1,000	189	401	429	158	12	3.633	.025	.007
12/3/63	11/30/64	2,795	±1,005	278	964	16	20	5	3.990	.029	.009
1/3/64	12/31/64	2,113	1,000	211	423	426	141	10	3.707	.020	.007
2/6/64	1/31/65	2,212	1,000	221	340	463	188	9	3.680	.023	.008
3/3/64	2/28/65	2,412	1,001	241	664	222	101	14	3.765	.018	.007
4/8/64	3/31/65	2,568	1,001	257	992	(?)	9	...	3.719	.028	.006
5/6/64	4/30/65	1,884	1,001	188	458	411	132	...	3.705	.020	.009
6/2/64	5/31/65	2,208	1,000	221	332	503	155	10	3.719	.013	.004
7/7/64	6/30/65	2,393	1,001	239	287	540	154	20	3.691	.010	.003
8/4/64	7/31/65	2,080	1,000	208	621	232	147	(³)	3.644	.023	.007
8/31/64	8/31/65	1,940	1,000	194	400	425	126	49	3.688	.018	.009
9/30/64	9/30/65	1,849	1,001	185	514	323	132	32	3.773	.020	.006
10/31/64	10/31/65	2,350	1,000	235	367	408	113	112	3.790	.013	.003
11/30/64	11/30/65	2,497	1,001	249	354	418	137	92	4.068	.088	.020
12/31/64	12/31/65	2,311	1,003	230	458	282	233	30	3.972	.022	.008
1/31/65	1/31/66	2,908	1,000	291	374	342	182	102	3.945	.009	.002
2/28/65	2/28/66	2,023	1,001	202	473	355	131	42	4.062	.030	.008
3/31/65	3/31/66	2,241	1,000	224	365	420	142	73	3.987	.023	.008
4/30/65	4/30/66	2,573	1,001	257	98	650	99	154	3.996	.005	.003
5/28/65	5/31/66	2,752	1,001	275	55	724	86	136	3.954	.003	.000
6/30/65	6/30/66	2,191	1,001	219	378	349	163	111	3.807	.031	.014
7/31/65	7/31/66	1,714	1,000	171	293	420	127	160	3.875	.021	.006
8/31/65	8/31/66	1,927	1,000	193	311	408	92	189	4.006	.018	.007
9/30/65	9/30/66	2,970	1,000	297	339	264	114	283	4.236	.024	.007
10/31/65	10/31/66	2,304	1,000	230	314	281	203	202	4.197	.013	.005
11/30/65	11/30/66	1,949	1,001	195	453	256	121	171	4.277	.028	.011
12/31/65	12/31/66	2,720	1,001	272	291	459	188	63	4.731	.018	.006
1/31/66	1/31/67	1,917	1,001	192	486	176	147	192	4.699	.025	.011
2/28/66	2/28/67	1,771	1,000	177	314	352	210	124	4.945	.032	.012
3/31/66	3/31/67	1,571	1,000	157	397	374	154	75	5.739	.060	.040
4/30/66	4/30/67	1,834	1,001	183	332	302	177	190	4.773	.039	.016
5/31/66	5/31/67	2,013	1,001	201	302	347	154	198	4.966	.035	.014
6/30/66	6/30/67	1,569	1,001	157	383	406	162	50	4.697	.165	.098
7/31/66	7/31/67	1,869	995	188	236	307	187	265	4.964	.048	.024
8/31/66	8/31/67	2,237	1,000	224	403	150	97	350	5.844	.054	.019
9/30/66	9/30/67	1,473	900	163	308	215	195	185	5.806	.081	.039
10/31/66	10/31/67	2,272	905	251	189	535	97	84	5.544	.011	.005
11/30/66	11/30/67	2,164	901	240	243	275	106	277	5.519	.016	.002
12/31/66	12/31/67	1,665	901	185	238	217	215	231	4.820	.076	.030

¹ Federal Reserve and Government Investment Accounts.² 100 per cent tax-and-loan-account credit.³ Less than \$500,000.⁴ 50 per cent tax-and-loan-account credit.

n.a. Not available.

APPENDIX TABLE 5
AUCTION RESULTS ON 9-MONTH TREASURY BILLS, MONTHLY, 1966

Issue date	Maturity date	Subscriptions			Allotments to—				Discount rates and spreads		
		Total	Accepted	Coverage ratio	Coml. banks	Nonbank dealers	Other public	Official accounts ¹	Average rate	High to low	Average to high
		In millions of dollars	In per cent		In millions of dollars				In per cent		
9/30/66	6/30/67	985	500	197	235	158	27	80	5.808	.086	.042
10/31/66	7/31/67	1,076	800	215	221	149	23	107	5.567	.046	.019
11/30/66	8/31/67	1,183	501	236	167	187	9	138	5.552	.036	.019
12/31/66	9/30/67	1,093	500	219	280	186	17	17	4.920	.111	.035

¹ Federal Reserve and Government Investment Accounts.

APPENDIX TABLE 6
TREASURY-BILL-STRIP AUCTION RESULTS

Issue date	Maturity date	Subscriptions			Allotments ¹ to—				Discount rates and spreads		
		Total	Accepted	Coverage ratio	Coml. banks	Nonbank dealers	Other public	Average length	Average rate	High to low	Average to high
		In millions of dollars	In per cent		In millions of dollars				In days	In per cent	
6/14/61	8/3/61-11/30/61	4,673	71,802	259	1,792		10	109.6	2.308	.043	.018
11/15/61	12/7/61-1/25/62	1,519	800	190	361	333	106	46.5	2.277	.148	.046
11/15/62	1/17/63-3/21/63	2,410	1,001	241	575	414	12	94.5	2.866	.049	.010
10/28/63	2/6/64-4/9/64	2,108	1,001	211	269	699	33	132.5	3.601	.041	.007
7/29/64	10/15/64-12/17/64	2,147	1,001	215	308	650	43	109.6	3.505	.040	.013
11/25/66	3/31/67-4/30/67	2,987	71,202	249	1,196		6	156.3	5.318	.120	.028

¹ None to Federal Reserve and Government Investment Accounts.

² 100 per cent tax-and-loan-account credit.

APPENDIX TABLE 7
REGULARLY ISSUED BILLS OUTSTANDING, SELECTED DATES

In millions of dollars

End of period	Amount outstanding			Yearly changes		
	Total	Holdings of—		Total	Holdings of—	
		Official accounts ¹	Public		Official accounts ¹	Public
November—1958	23,416	2,141	21,275	...	...	...
December—1958	24,016	2,331	21,685	600	190	410
1959	33,637	2,812	30,825	9,621	481	9,140
1960	32,431	3,713	28,718	-1,206	901	-2,107
1961	37,430	3,708	33,722	4,999	-5	5,004
1962	45,246	3,475	41,771	7,816	-233	8,049
1963	49,538	5,466	44,072	4,292	1,991	2,301
1964	52,468	7,572	44,896	2,930	2,106	824
1965	53,651	9,800	43,851	1,183	2,228	-1,045
1966	57,760	13,254	44,506	4,109	3,454	655

¹ Federal Reserve and Government Investment Accounts.

² Includes a net increase of \$400 million in bills dated Dec. 3, 1966, delivered Jan. 3, 1967.

APPENDIX TABLE 8
TREASURY COUPON SECURITIES ISSUED IN RIGHTS AND IN CASH
QUARTERLY REFINANCINGS, AUGUST 1960–DECEMBER 1966

Issue date	Description	Term (in years and months)	Amounts (in millions of dollars) in—				
			Rights refunding		Cash refinancing		
			Total issued ¹	Issued to public	Subscrip- tions ²	Allotments	
						Total ¹	To public
8/15/60	3 1/8% C.I. 8/1/61	0-11 1/2			11,848	7,829	2,288
11/15/60	3 3/8% Bd. 5/15/68	7-9			5,158	1,070	1,045
	3 3/8% Nt. 2/15/62	1-3	9,098	3,996			
	3 3/8% Bd. 5/15/66	5-6	1,213	1,207			
2/15/61	3 1/4% Nt. 8/15/62	1-6			15,375	7,325	3,720
5/15/61	3 1/4% C.I. 5/15/62	1-0			12,001	5,509	3,691
	3 1/4% Nt. 5/15/63	2-0			12,110	2,753	1,916
8/1/61	3 1/4% Nt. 11/15/62	1-3 1/2	6,082	2,696			
	3 3/4% Nt. 8/15/64	3-0 1/2	5,019	3,419			
	3 3/8% Bd. 5/15/68	6-9 1/2					
11/15/61	3 1/4% Nt. 2/15/63	1-3	3,642	3,574			
	3 3/4% Bd. 5/15/66	4-6	2,384	2,380			
	3 3/8% Bd. 11/15/74	13-0	517	381			
2/15/62	3 1/2% C.I. 2/15/63	1-0	6,862	3,451			
	4 1/8% Nt. 8/15/66	4-6	4,454	2,936			
5/15/62	3 1/4% C.I. 5/15/63	1-0	6,686	4,356			
	3 3/8% Nt. 2/15/66	3-9	3,114	3,097			
	3 3/8% Bd. 11/15/71	9-6	1,204	1,140			
8/15/62	3 1/2% C.I. 8/15/63	1-0			16,351	6,852	3,048
	4 1/8% Bd. 2/15/69	6-6			6,643	1,844	1,744
	4 1/4% C.I. 11/15/63	30-0			315	365	315
11/15/62	3 1/2% Nt. 11/15/63	1-0	4,856	1,060			
	3 1/2% Nt. 11/15/65	3-0	3,286	3,285			
	4 1/8% Bd. 2/15/72	9-3	2,344	2,338			
2/15/63	3 1/4% C.I. 2/15/64	1-0	6,741	2,818			
	3 3/8% Bd. 8/15/68	5-6	2,490	2,475			
5/15/63	3 1/4% C.I. 5/15/64	1-0	5,693	2,366			
	3 3/8% Nt. 2/15/66	2-9	3,273	3,188			
8/15/63	3 3/8% Nt. 11/15/64	1-3	6,398	2,249			
11/15/63	3 3/8% Nt. 5/15/65	1-6			16,064	7,977	3,972
2/15/64	3 3/8% Nt. 8/13/65	1-6	6,202	2,188			
	4 1/8% Nt. 8/15/66	2-6	1,810	1,810			
5/15/64	4 1/8% Nt. 11/15/65	1-6	8,560	2,177			
	4 1/4% Bd. 5/15/74	10-0	1,532	1,503			
8/15/64	3 3/8% Nt. 2/15/66	1-6			12,985	4,040	2,173
11/15/64	4 1/8% Nt. 5/15/66	1-6			15,458	9,519	3,077
2/15/65	4 1/8% Nt. 11/15/66	1-9			10,149	2,253	1,766
5/15/65	3 4 1/8% Nt. 8/15/66	1-3	5,904	1,651			
	4 1/4% Bd. 5/15/74	9-0	2,062	1,997			
8/13/65	4 1/4% Nt. 2/15/67	1-6	5,151	2,100			
	3 4 1/8% Bd. 2/15/69	3-6	1,884	808			
11/15/65	4 1/4% Nt. 5/15/67	1-6			5,490	9,748	3,171
2/15/66	4 7/8% Nt. 8/15/67	1-6	2,117	867			
	5 1/8% Nt. 11/15/70	4-9	42,839	1,819			
5/15/66	4 7/8% Nt. 11/15/67	1-6	8,135	1,450			
8/15/66	5 1/4% C.I. 8/15/67	1-0	5,919	1,440			
	5 1/4% Nt. 5/15/71	4-9	42,578	1,059			
11/15/66	5 1/8% Nt. 2/15/68	1-3			5,016	2,635	1,791
	5 1/8% Nt. 11/15/71	5-0			14,029	1,734	1,734
Total (in millions of dollars)			140,798	74,971	158,992	71,453	35,451
Average term, total			2 yrs.-4 mos.		1 yr.-10 mos.		
Other than anchor issues:							
Amounts (in millions of dollars)			42,752	35,533	38,255	7,766	6,754
Average term, total			5 yrs.-0 mos.		5 yrs.-10 mos.		

¹ Including issues to Federal Reserve System and Government Investment Accounts.

² Public only.

³ Repointing.

⁴ Excluding pre-refundings.

APPENDIX TABLE 9
DEALER ACTIVITY IN QUARTERLY RIGHTS REFUNDINGS, 1961-66¹

Date of refunding	Issues			Maximum position in rights and new issues ²		Cumulative volume of trading			
	In millions of dollars		Dealers as per cent of public			Rights ³		New issues ⁴	
	To the public, total	To dealers ⁵		Amount (in millions of dollars)	Per cent of issues to public	Amount (in millions of dollars)	Per cent of issues to public	Amount (in millions of dollars)	Per cent issues to public
8/1/61	6,806	1,013	14.9	867	12.7	1,455	20.4	n.a.	n.a.
11/15/61	6,335	1,112	17.6	760	12.1	1,748	27.6	1,252	19.8
2/15/62	6,387	580	9.1	458	7.2	n.a.	n.a.	1,006	15.8
5/15/62	8,593	1,037	12.1	766	8.9	1,329	15.5	1,193	13.9
11/15/62	6,683	838	12.5	651	9.7	1,478	22.1	1,201	18.0
2/15/63	5,293	814	15.4	469	8.9	1,343	25.4	1,134	21.4
5/15/63	5,554	713	12.8	707	12.7	1,265	22.8	754	13.6
8/15/63	2,249	231	10.3	233	10.4	543	24.1	402	17.9
2/15/64	3,998	716	17.9	575	13.4	1,088	27.2	956	23.9
5/15/64	3,680	594	16.1	464	12.6	769	20.9	843	22.9
5/15/65	3,648	963	26.4	659	18.1	981	26.9	956	26.2
8/13/65	2,907	409	14.1	351	12.1	1,205	41.5	846	29.1
5/15/66	1,450	334	23.0	294	20.3	386	26.6	447	30.8
Total, or average	63,583	9,354	14.7	7,254	11.3				
Excluding 8/1/61	56,777							10,989	19.0
Excluding 2/15/62	57,196					13,590	23.8		

¹ Excluding combination maturity and pre-refundings in February and August 1966.

² Includes position in outstanding reopened issues except in August 1961 refunding.

³ While books were open.

⁴ Through seventh day after announcement.

⁵ Dealers reporting to the Federal Reserve Bank of New York. n.a. Not available.

APPENDIX TABLE 10
DEALER ACTIVITY IN QUARTERLY CASH REFINANCINGS, 1961-66

Date of refunding	Allotments			Maximum position in new issues ²		Cumulative volume of trading ³	
	In millions of dollars		Dealers as per cent of public				
	To the public, total	To dealers ¹		Amount (in millions of dollars)	Per cent of public allotments	Amount (in millions of dollars)	Per cent of public allotments
2/15/61	3,720	n.a.	n.a.	180	4.8	1,004	27.0
5/15/61	5,607	406	7.2	548	9.8	1,383	24.7
8/15/62	5,107	340	6.7	312	6.1	1,516	29.7
11/15/63	3,972	556	14.0	444	11.2	928	23.4
8/15/64	2,173	431	19.8	479	22.0	936	43.1
11/15/64	3,077	355	11.5	260	8.4	867	28.2
2/15/65	1,766	284	16.1	209	10.8	571	32.3
11/15/65	3,171	397	12.5	357	11.3	454	14.3
11/15/66	3,525	735	20.9	692	19.6	738	20.9
Total, or average	32,118	.....	.....	3,481	10.8	8,397	26.1
Excluding 2/15/61	28,398	3,504	12.3	.....	.....	.....	.....

¹ Dealers reporting to the Federal Reserve Bank of New York.

² In total new issues (where more than one). Includes positions in outstanding issues that were reopened.

³ Trading through seventh day after announcement. Includes trading in outstanding issues that were reopened.

n.a. Not available.

APPENDIX TABLE 11
ADVANCE REFUNDINGS, 1960-66

Old issues				New issues				Effect on		For noncallable holders	
Description	Amount outstanding (in millions of dollars)		Term to maturity (in years and months)	Description	Term to maturity (in years and months)	Ex-tension (in years and months)	Amount of exchanges		Average yield on marketable debt (in months)	Boot paid Treasury (\$100 (+) or (-))	Approximate yield on debt (in percent) from exchange date to maturity 1
	Total	Pub-licly held					In millions of dollars	Percentage exchanged			
							Total	Pub-licly held	Total		
June 1960:											
2 1/2 % 11/15/61	11,177	10,994	1-5	3 3/4 % 5/15/64	3-11	2-6	3,893	3,814	34.8	...	4.24
Total	11,177	10,994		3 3/4 % 5/15/68	7-11	2-10	4,214	4,077	37.7	...	4.14
October 1960:											
2 1/2 % 12/15/62-67	2,109	1,839	6-8 1/2	3 1/2 % 11/15/60	20-11 1/2	13-5	643	512	30.5	...	3.92
2 1/2 % 12/15/63-68	2,815	2,391	8-2 1/2	3 1/2 % 2/15/60	21-2	21-5	772	772	27.8	...	4.23
2 1/2 % 12/15/64-69	3,738	3,281	8-8 1/2	3 1/2 % 11/15/68	38-1 1/2	29-5	1,095	993	29.3	...	4.09
2 1/2 % 12/15/64-69	3,812	3,288	9-2 1/2	3 1/2 % 38-1 1/2	38-1 1/2	24-7	1,248	1,113	32.7	...	4.14
Total	12,474	10,801					3,979	3,395	31.9	...	3.99
March 1961:											
2 3/4 % 6/15/59-62	5,262	4,743	1-3	3 3/4 % 11/15/67	6-8	5-5	1,296	1,226	24.6	...	3.98
2 3/4 % 12/15/59-62	3,439	2,710	1-9	3 3/4 % 11/15/67	6-8	4-11	1,177	819	34.1	...	3.75
2 3/4 % 12/15/60-63	6,755	6,066	1-11	3 3/4 % 11/15/67	6-8	3-3	1,131	2,398	28.5	...	3.75
2 1/2 % 8/15/63	6,755	6,066	2-5	3 3/4 % 11/15/68	6-8	4-4	6,041	5,442	31.1	...	3.63
Total	19,436	17,947								...	4.09
September 1961:											
2 1/2 % 3/15/65-70	4,688	3,351	8-6	3 1/2 % 11/15/60	19-2	19-1	1,935	589	22.1	2.25	4.31
2 1/2 % 3/15/66-71	2,927	2,180	9-6	3 1/2 % 2/15/60	37-2	19-8	495	469	10.6	-2.00	4.26
Total	7,615	5,531		3 1/2 % 11/15/68	38-5	9-8	238	203	8.1	3.50	4.30
March 1962:											
2 1/2 % 2/15/64	3,854	3,688	1-11 1/2	3 1/2 % 11/15/68	37-2	19-2	3,757	2,826	49.3	-1.00	4.36
2 3/4 % 2/15/65	6,862	6,088	0-5	3 1/2 % 2/15/60	37-2	19-2	1,154	1,034	29.9	...	4.30
2 1/2 % 6/15/67-72	1,757	1,575	10-3 1/2	3 1/2 % 2/15/60	37-2	19-2	1,363	386	8.2	2.00	4.32
2 1/2 % 9/15/67-72	2,716	2,356	10-6 1/2	3 1/2 % 2/15/60	37-2	19-2	233	198	13.3	2.25	4.36
2 1/2 % 12/15/67-72	3,515	3,227	10-9 1/2	3 1/2 % 2/15/60	37-2	19-2	322	299	9.2	3.50	4.30
Total	18,739	16,935		3 1/2 % 2/15/60	37-2	19-2	333	281	8.7	...	4.38
September 1962:											
3 1/2 % 2/15/63	6,862	3,354	0-5	3 1/2 % 2/15/60	37-2	19-2	5,201	4,176	27.8	...	4.17
2 3/4 % 2/15/63	3,632	2,997	0-5	3 1/2 % 2/15/60	37-2	19-2	772	772	11.3	...	4.11
3 1/4 % 2/15/63	3,642	3,381	0-5	3 1/2 % 2/15/60	37-2	19-2	370	370	5.4	2.00	4.20
3 3/4 % 5/15/63	6,685	4,119	0-8	3 1/2 % 2/15/60	37-2	19-2	1,259	91	10.0	2.25	4.21
3 3/4 % 5/15/63	5,047	3,975	0-8	3 1/2 % 2/15/60	37-2	19-2	981	966	27.0	3.50	4.30
4 % 5/15/63	1,743	1,649	0-8	3 1/2 % 2/15/60	37-2	19-2	402	367	11.0	...	4.19
Total	26,819	19,074		3 1/2 % 2/15/60	37-2	19-2	449	444	6.7	...	4.19
September 1962:											
3 1/2 % 2/15/63	6,862	3,354	0-5	3 1/2 % 2/15/60	37-2	19-2	1,297	25.8	32.6	...	3.94
2 3/4 % 2/15/63	3,632	2,997	0-5	3 1/2 % 2/15/60	37-2	19-2	772	772	11.3	...	4.12
3 1/4 % 2/15/63	3,642	3,381	0-5	3 1/2 % 2/15/60	37-2	19-2	370	370	5.4	...	4.06
3 3/4 % 5/15/63	6,685	4,119	0-8	3 1/2 % 2/15/60	37-2	19-2	1,259	91	10.0	...	3.81
3 3/4 % 5/15/63	5,047	3,975	0-8	3 1/2 % 2/15/60	37-2	19-2	981	966	27.0	...	3.90
4 % 5/15/63	1,743	1,649	0-8	3 1/2 % 2/15/60	37-2	19-2	402	367	11.0	...	4.12
Total	26,819	19,074		3 1/2 % 2/15/60	37-2	19-2	449	444	6.7	...	4.06
September 1962:											
3 1/2 % 2/15/63	6,862	3,354	0-5	3 1/2 % 2/15/60	37-2	19-2	1,297	25.8	32.6	...	3.81
2 3/4 % 2/15/63	3,632	2,997	0-5	3 1/2 % 2/15/60	37-2	19-2	772	772	11.3	...	4.12
3 1/4 % 2/15/63	3,642	3,381	0-5	3 1/2 % 2/15/60	37-2	19-2	370	370	5.4	...	4.06
3 3/4 % 5/15/63	6,685	4,119	0-8	3 1/2 % 2/15/60	37-2	19-2	1,259	91	10.0	...	3.81
3 3/4 % 5/15/63	5,047	3,975	0-8	3 1/2 % 2/15/60	37-2	19-2	981	966	27.0	...	3.90
4 % 5/15/63	1,743	1,649	0-8	3 1/2 % 2/15/60	37-2	19-2	402	367	11.0	...	4.12
Total	26,819	19,074		3 1/2 % 2/15/60	37-2	19-2	449	444	6.7	...	4.06

January, 1965:									
February 1965 maturities									
2 5/8%	2 1/5 65	3,442	0-1	4 1/8%	2/15/70	5-1	5-0	674	4.16
3 3/8%	2/15/74			4 3/8%	2/15/74	9-1	9-0	493	4.23
4 1/8%	8/15/87			4 3/4%	8/15/87	9-2	27-6	641	4.24
November 1965-November 1967 maturities									
3 1/2%	11/15/65	2,954	0-10	4 1/8%	2/15/70	5-1	4-3	640	4.23
4 1/8%	8/15/87			4 3/8%	8/15/87	27-7	26-9	316	4.28
4 3/8%	2/15/70			4 3/4%	2/15/70	5-1	4-3	176	4.30
4 3/4%	2/15/74			4 3/8%	2/15/74	9-1	8-3	140	4.38
4 3/8%	8/15/87			4 3/4%	8/15/87	9-2	26-9	588	4.38
3 3/8%	2/15/70	3,260	1-1	4 3/8%	2/15/70	5-1	8-0	334	4.27
4 1/8%	8/15/87			4 3/4%	8/15/87	27-7	26-6	144	4.38
4 3/8%	2/15/74			4 3/4%	2/15/74	9-1	8-0	399	4.38
4 3/4%	8/15/87			4 3/8%	8/15/87	27-7	26-6	665	4.26
3 3/8%	2/15/66	4,040	1-1	4 1/8%	2/15/70	5-1	3-9	300	4.24
3 3/4%	5/15/66	2,250	1-4	4 3/8%	8/15/87	27-7	26-3	147	4.24
3 3/4%	8/15/67	4,433	2-7	4 3/8%	2/15/70	5-1	2-6	903	4.24
3 3/8%	11/15/67	3,604	2-10	4 3/8%	2/15/74	9-1	6-6	461	4.32
2 5/8%	2 15 65	3,976	3,442	4 3/8%	8/15/87	27-7	23-3	738	4.28
Subtotal:				4 3/4%	2/15/74	9-1	23-9	122	4.25
11/65 11/67 maturities	29,101	18,682		4 3/4%	8/15/87	27-7	14-1	1,808	4.25
Total	33,077	22,124				9-3	7,957	4.25
February 1966:							10-2	9,765	4.25
Preceding:									
3 3/4%	5/15/66	1,668	0-3						
3 3/8%	8/15/66	2,254	0-6						
4 1/8%	11/15/66	1,024	0-6						
Total	11,060	5,118						
Total	23,291	10,487						
August 1966:									
Preceding:									
4 3/4%	11/15/66	1,652	0-3						
4 1/8%	11/15/66	2,254	0-3						
3 3/8%	8/15/66	1,024	0-6						
Total	5,757	4,901						
Total June 1960-August 1966		286,037	204,019						

¹ Based on prices of issues eligible for exchange—mean of bid and ask prices at noon on day before announcement, adjusted for boot payments.

² Not eligible for noncallable exchange privileges.

³ Less than .05 per cent.

Note.—All items were made public by the Office of the Secretary of the Treasury, Office of Debt Analysis, or are derivable from public sources.

APPENDIX TABLE 12
EXCHANGES IN ADVANCE REFUNDINGS BY INVESTOR CLASSES, 1960-65

In millions of dollars

Advance refunding	Public										Official accounts ¹	Total	
	Commer- cial banks	Dealers and brokers	Corpora- tions	Insurance companies	Mutual savings banks	Private pension funds	State and local funds		Individuals	All other			
							Pension	Other			Total		
1960—June	2,685	160	228	204	71	41	39	202	148	300	4,077	137	4,214
Oct	267	154	55	1,090	823	66	292	275	120	254	3,395	583	3,979
1961—Mar	3,378	324	185	328	150	41	54	302	173	508	5,442	599	6,041
Sept	192	132	24	1,337	363	34	280	228	81	156	2,826	931	3,757
1962—Mar	1,877	348	89	308	132	75	290	270	369	419	4,176	1,024	5,201
Sept	4,731	1,194	185	186	149	57	44	222	113	639	7,519	341	7,860
1963—Mar	4,403	1,567	237	238	99	68	106	143	133	687	7,680	325	8,005
Sept	3,365	1,539	174	193	210	56	125	277	132	480	6,548	197	6,745
1964—Jan.	1,442	658	82	109	42	15	29	72	56	153	2,657	314	2,971
July	5,501	1,086	289	326	240	125	18	422	313	935	9,258	26	9,284
1965—Jan	5,650	1,426	214	376	148	54	74	262	175	684	9,063	702	9,765
Total	33,490	8,587	1,762	4,695	2,427	632	1,351	2,675	1,813	5,213	62,644	5,176	67,820

¹ Federal Reserve and Government Investment Accounts.

NOTE.—Figures may not add to totals because of rounding.

APPENDIX TABLE 13
EXCHANGES IN SENIOR AND IN PRE- AND JUNIOR ADVANCE
REFUNDINGS BY INVESTOR CLASSES, 1960-65

In millions of dollars

Investor class	Senior refundings ¹				Pre- and junior refundings ²	Total
	Oct. 1960	Sept. 1961	Mar. 1962	Total		
<i>Public, total</i>	3,395	2,826	1,394	7,615	55,030	62,644
Commercial banks	267	192	171	630	32,361	33,490
Dealers and brokers	154	132	110	396	8,192	8,587
Corporations	55	24	40	119	1,643	1,762
Insurance companies	1,090	1,337	156	2,583	2,112	4,695
Mutual savings banks	823	363	58	1,244	1,183	2,427
Private pension funds	66	34	32	132	500	632
State and local funds:						
Pension	292	280	243	815	536	1,351
Other	275	228	138	641	2,034	2,675
Individuals	120	81	215	416	1,397	1,813
All other	254	156	231	641	4,573	5,213
<i>Official accounts</i>	583	931	439	1,953	3,222	5,176
Total	3,979	3,757	1,833	9,569	58,253	67,820

¹ Eligible issues with remaining terms to maturity of over 5 years.² Eligible-issue maturities in pre-refundings, 1 year or less; in junior refundings, 1-5 years.

NOTE.—Figures may not add to totals due to rounding.

APPENDIX TABLE 14
YIELDS ON LONG-TERM TREASURY, MUNICIPAL, AND PRIVATE SECURITIES, 1960-66
Monthly averages

In per cent per annum

Month	1960				1962				1964				1966			
	Bonds		FHA		Bonds		FHA		Bonds		FHA		Bonds		FHA	
	Long-term Treasury	All corporate (new) ¹	Municipal (new) ¹	Mortgages ²	Long-term Treasury	All corporate (new) ¹	Municipal (new) ¹	Mortgages ²	Long-term Treasury	All corporate (new) ¹	Municipal (new) ¹	Mortgages ²	Long-term Treasury	All corporate (new) ¹	Municipal (new) ¹	Mortgages ²
Jan.	4.37	5.25	3.72	6.24	4.08	4.55	3.34	5.72	4.15	4.49	3.22	5.44	4.43	4.93	3.52	5.70
Feb.	4.02	4.78	3.44	6.04	3.89	4.36	3.15	5.68	4.18	4.45	3.28	5.43	4.63	5.33	3.72	5.75
Mar.	4.08	4.89	3.56	6.23	4.01	4.45	3.15	5.68	4.18	4.45	3.28	5.43	4.63	5.33	3.72	6.00
Apr.	4.18	4.94	3.56	6.21	3.89	4.31	3.06	5.65	4.20	4.49	3.28	5.44	4.55	5.38	3.56	6.16
May	4.16	4.95	3.60	6.21	3.88	4.26	3.11	5.61	4.16	4.48	3.20	5.44	4.57	5.55	3.65	6.32
June	3.98	4.85	3.55	6.19	3.90	4.30	3.26	5.60	4.13	4.49	3.20	5.44	4.63	5.67	3.77	6.45
July	3.86	4.68	3.50	6.18	4.02	4.41	3.28	5.60	4.13	4.43	3.19	5.44	4.75	5.80	3.95	6.51
Aug.	3.79	4.48	3.34	6.14	3.98	4.39	3.23	5.58	4.14	4.43	3.19	5.44	4.80	6.04	4.12	6.58
Sept.	3.94	4.68	3.53	6.09	3.89	4.26	3.02	5.55	4.16	4.49	3.25	5.44	4.70	6.04	3.92	6.72
Oct.	3.91	4.68	3.53	6.09	3.89	4.26	3.02	5.55	4.16	4.49	3.25	5.44	4.70	6.04	3.92	6.72
Nov.	3.93	4.76	3.40	6.05	3.87	4.23	3.04	5.53	4.12	4.47	3.18	5.44	4.74	6.11	3.87	6.81
Dec.	3.88	4.93	3.40	6.04	3.87	4.28	3.07	5.53	4.14	4.47	3.13	5.44	4.65	5.98	3.86	6.77
Month	1961				1963				1965				1966			
	Bonds		FHA		Bonds		FHA		Bonds		FHA		Bonds		FHA	
	Long-term Treasury	All corporate (new) ¹	Municipal (new) ¹	Mortgages ²	Long-term Treasury	All corporate (new) ¹	Municipal (new) ¹	Mortgages ²	Long-term Treasury	All corporate (new) ¹	Municipal (new) ¹	Mortgages ²	Long-term Treasury	All corporate (new) ¹	Municipal (new) ¹	Mortgages ²
Jan.	3.89	4.63	3.40	6.00	3.89	4.22	3.10	5.52	4.14	4.44	3.06	5.43	4.43	4.93	3.52	5.70
Feb.	3.81	4.43	3.31	5.89	3.92	4.25	3.15	5.50	4.16	4.44	3.09	5.43	4.43	4.93	3.52	5.70
Mar.	3.78	4.36	3.45	5.82	3.93	4.26	3.05	5.47	4.15	4.49	3.18	5.43	4.43	4.93	3.52	5.70
Apr.	3.73	4.36	3.45	5.82	3.93	4.26	3.05	5.47	4.15	4.49	3.18	5.43	4.43	4.93	3.52	5.70
May	3.73	4.66	3.43	5.75	3.97	4.35	3.11	5.44	4.13	4.52	3.17	5.43	4.43	4.93	3.52	5.70
June	3.88	4.75	3.52	5.72	4.00	4.32	3.21	5.44	4.14	4.57	3.24	5.43	4.43	4.93	3.52	5.70
July	3.90	4.74	3.52	5.70	4.01	4.34	3.22	5.44	4.15	4.57	3.27	5.43	4.43	4.93	3.52	5.70
Aug.	4.03	4.76	3.52	5.71	3.99	4.34	3.15	5.44	4.19	4.66	3.24	5.43	4.43	4.93	3.52	5.70
Sept.	4.02	4.67	3.53	5.72	4.04	4.30	3.20	5.43	4.25	4.71	3.35	5.46	4.43	4.93	3.52	5.70
Oct.	3.98	4.45	3.42	5.72	4.07	4.36	3.19	5.43	4.28	4.69	3.40	5.40	4.43	4.93	3.52	5.70
Nov.	4.06	4.61	3.44	5.72	4.11	4.42	3.14	5.43	4.31	4.74	3.43	5.43	4.43	4.93	3.52	5.70
Dec.	4.06	4.58	3.47	5.71	4.14	4.49	3.27	5.44	4.34	4.90	3.54	5.43	4.43	4.93	3.52	5.70

¹ Average of weekly closing rates, as estimated by the U.S. Treasury.

² Bond Buyer's 20-bond index.

³ Average yield, as of the first of the succeeding month, on new 25-year mortgages through 1965 and on new 30-year mortgages beginning 1966. Compiled by FHA.

⁴ Adjusted to reflect value of deferred call provisions beginning in 1966.

APPENDIX TABLE 15
DEALER ACTIVITY IN ADVANCE REFUNDINGS, 1960-65

Date of refunding	Issues			Maximum position in rights and new issues ¹		Cumulative volume of trading			
	In millions of dollars		Dealers as per cent of public			Rights ²		New issues	
	To the public, total	To dealers		Amounts (in millions of dollars)	Per cent of issues to public	Amounts (in millions of dollars)	Per cent of issues to public	Amounts (in millions of dollars)	Per cent of issues to public
6/23/60	4,077	n.a.	n.a.	197	4.8	292	7.2	*119,750	2.9
10/3/60	3,396	388	11.8	80	2.4	55	1.6	**102	1.5 3.0
3/30/61	5,443	364	6.7	334	6.1	563	10.3	*174	3.2
9/29/61	2,827	163	5.8	57	2.0	150	5.3	*119,750	4.2
3/9/62	4,178	450	10.8	279	6.7	n.a.	n.a.	*312	7.5
9/20/62	7,520	1,515	20.1	772	10.3	2,163	28.8	**504	12.1
3/15/63	7,681	2,288	29.8	983	12.8	3,773	49.1	*1,029	13.7
9/18/63	6,551	2,210	33.7	967	14.8	2,043	31.2	**1,286	17.1
1/29/64	2,658	1,052	39.6	716	26.9	1,141	42.9	*1,996	26.0
7/24/64	9,255	2,433	26.3	1,107	12.0	2,702	29.2	**2,412	31.4
1/19/65	9,063	2,447	27.0	1,184	13.1	2,833	31.3	*1,042	15.9
								**1,840	28.1
								*554	20.8
								*1,170	44.0
								*1,788	19.3
								**2,519	27.2
								*1,829	20.2
								**2,642	29.2
Total, or average	62,649	13,315	21.2	6,676	10.7	...	...	...	...
Excluding:									
3/9/62	58,471	...	...	...	...	15,715	26.9	...	...
6/23/60-1/3/62	19,921	1,365	6.9	947	4.8	...	...	*774	3.9
9/20/62-1/19/65	42,728	11,945	28.0	5,728	13.4	...	...	*8,238	19.3
								**11,869	27.8

¹ Includes position in outstanding reopened issues.

² Through fourth day after announcement.

* Through fifth day after announcement.

** Through seventh day after announcement.

n.a. Not available.

SOURCE.—Federal Reserve Bank of New York.

APPENDIX TABLE 16
ADVANCE REFUNDINGS, 1960-65: NEW ISSUES OFFERED,
TERMS TO MATURITY, AND ALLOTMENTS TO TOTAL PUBLIC AND DEALERS

Advance refunding of—	New issue offered	Term (in years and months)	Issues (in millions of dollars) to—		Dealers as per cent of public
			Public	Dealers ¹	
6/23/60.....	3½% Nt. 5/15/64 3½% Bd. 5/15/68	3-11 7-11	3,814 263 4,077	n.a. n.a.	n.a. n.a.
10/3/60.....	3½% Bd. 11/15/80 3½% Bd. 2/15/90 ¹ 3½% Bd. 11/15/98	20-1½ 29-1½ 39-1½	512 777 2,107 3,396	n.a. n.a. n.a.	n.a. n.a. n.a.
3/30/61.....	3½% Bd. 11/15/67 3½% Bd. 11/15/66	6-8 5-8	3,044 2,399 5,443	210 154 364	6.9 6.4 6.7
9/29/61.....	3½% Bd. 11/15/80 ¹ 3½% Bd. 2/15/90 ¹ 3½% Bd. 11/15/98 ¹	19-2 28-5 37-2	793 1,137 897 2,827	10 153 163	1.3 7.5 5.8
3/9/62.....	4% Bd. 8/15/71 4% Bd. 2/15/80 ¹ 3½% Bd. 11/15/98 ¹	9-5½ 17-11½ 36-8½	2,398 386 682 712 4,178	163 166 23 98 450	6.8 43.0 3.4 13.7 10.8
9/20/62.....	3½% Nt. 8/15/67 4% Bd. 8/15/72	4-11 9-11	5,261 2,259 7,520	754 761 1,515	14.3 33.7 20.1
3/15/63.....	3½% Nt. 2/15/67 3½% Bd. 11/15/71 ¹ 3½% Bd. 11/15/74 ¹ 4% Bd. 2/15/80 ¹	3-11 8-8 11-8 16-11	4,267 1,485 922 1,007 7,681	890 574 214 611 2,288	20.9 38.7 23.2 60.7 29.8
9/18/63.....	3½% Bd. 11/15/68 4% Bd. 8/15/73 4½% Bd. 5/15/89-94 ¹	5-2 9-11 30-8	1,568 3,723 1,260 6,551	446 919 845 2,210	28.4 24.7 67.1 33.7
1/29/64.....	4% Bd. 8/15/70 ¹ 4¾% Bd. 5/15/75-85 ¹	6-6¾ 21-3¾	2,035 623 2,658	626 426 1,052	30.8 68.4 39.6
7/24/64.....	4% Bd. 10/1/69 ¹ 4¾% Bd. 11/15/73 4¾% Bd. 8/15/87-92 ¹	5-2½ 9-3¾ 28-0¾	3,726 4,353 1,176 9,255	429 1,179 825 2,433	11.5 27.1 70.2 26.3
1/19/65.....	4% Bd. 2/15/70 4¾% Bd. 2/15/74 4¾% Bd. 8/15/87-92 ¹	5-1 9-1 27-7	4,059 2,805 2,199 9,063	332 518 1,597 2,447	8.2 18.5 73.6 27.0
First 5 refundings—					
Maturities: Within 15 years.....			11,918	770	6.5
After 15 years.....			8,003	795	7.4
Last 6 refundings—					
Maturities: Within 15 years.....			36,463	7,641	21.0
After 15 years.....			6,265	4,304	68.7

¹ Reopened issue.² Partly estimated.

n.a. Not available.

SOURCE.—Federal Reserve Bank of New York

APPENDIX TABLE 17
TREASURY BONDS WITH OVER 10 YEARS TO MATURITY ISSUED IN CASH
FINANCINGS AND REGULAR REFUNDINGS AT MATURITY
AND IN ADVANCE REFUNDINGS, 1960-65

Issue date	Description	Term (in years and months)	Amount issued (in millions of dollars)	Type of financing	Offering yield (in per cent)	Spread (in per cent) above outstanding-issue yields	
Cash financings and regular refundings							
4/5/60.....	4¼% Bd.	5/15/75-85	25-1½	470	New cash	4.25	.15
11/15/61.....	3¾% Bd.	11/15/74	13-0	517	Rights	3.975	.14
8/15/62.....	4¼% Bd.	8/15/87-92	30-0	365	Cash refund.	4.19	.13
1/17/63.....	4% Bd.	2/15/88-93	30-1	250	New cash (auction)	4.008	.08
4/18/63.....	4⅝% Bd.	5/15/89-94	31-1	300	New cash (auction)	4.093	.08
Total, or average.....		24-4	1,902		4.13	.12	
Advance refundings							
10/3/60.....	3½% Bd.	11/15/80	20-1½	643	Senior	3.92	.05
	3½% Bd.	2/15/90	29-4½	993	Senior	3.96	.09
	3½% Bd.	11/15/98	38-1½	2,343	Senior	3.98	.12
9/29/61.....	3½% Bd.	11/15/80	19-2	1,273	Senior	4.155	.125
	3½% Bd.	2/15/90	28-5	1,298	Senior	4.22	.14
	3½% Bd.	11/15/98	37-2	1,187	Senior	4.19	.13
3/9/62.....	4% Bd.	2/15/80	17-1½	563	Junior	4.20	.13
	3½% Bd.	2/15/90	27-1½	900	Senior	4.205	.125
	3½% Bd.	11/15/98	36-8½	933	Senior	4.185	.135
3/15/63.....	3⅞% Bd.	11/15/74	11-8	1,074	Junior	3.975	.085
	4% Bd.	2/15/80	16-11	1,130	Pre.- and Jr.	4.036	.086
9/18/63.....	4⅛% Bd.	5/15/89-94	30-8	1,260	Pre.- and Jr.	4.207	.127
Subtotal, or average.....		27-1	13,597		4.10	.115	
1/29/64.....	4¼% Bd.	5/15/75-85	21-3¾	747	Pre.- and Jr.	4.25	.06
7/24/64.....	4¼% Bd.	8/15/87-92	28-0¾	1,199	Pre.- and Jr.	4.245	.095
1/19/65.....	4¼% Bd.	8/15/87-92	27-7	2,254	Pre.- and Jr.	4.247	.047
Subtotal, or average.....		26-7	4,200		4.25	.06	
Total, or average.....		27-0	17,797		4.13	.10	

APPENDIX TABLE 18
TREASURY SECURITIES MATURING IN 3 THROUGH 10 YEARS ISSUED IN CASH
FINANCINGS AND REGULAR REFUNDINGS AT MATURITY AND IN
ADVANCE REFUNDINGS, 1960-66

Issue date	Description	Term (in years and months)	Amount issued (in millions of dollars)	Type of financing	Offering yield (in per cent)	Spread (in per cent) above outstanding-issue yields	
Cash financings and regular refundings							
5/15/60	4 $\frac{3}{4}$ % Nt.	5/15/65	5-0	2,113	Rights	4.625	.165
8/15/60	3 $\frac{3}{4}$ % Bd.	5/15/68	7-9	1,070	Cash rfdg.	3.875	.085
11/15/60	3 $\frac{3}{4}$ % Bd.	5/15/66	5-6	1,213	Rights	3.75	.01
8/1/61	3 $\frac{3}{4}$ % Nt.	8/15/64	3 $\frac{1}{2}$	5,019	Rights	3.75	.15
11/15/61	3 $\frac{3}{4}$ % Bd.	5/15/68	6-9 $\frac{1}{2}$	749	Rights	3.98	.10
	3 $\frac{3}{4}$ % Bd.	5/15/66	4-6	2,384	Rights	3.81	.10
1/24/62	4 $\frac{1}{2}$ % Bd.	10/1/69	7-8 $\frac{1}{2}$	1,114	New cash	4.04	.11
2/15/62	4 $\frac{1}{2}$ % Nt.	8/15/66	4-6	4,454	Rights	4.00	.07
4/18/62	3 $\frac{3}{4}$ % Bd.	8/15/68	6-4	1,258	New cash	3.75	.14
5/15/62	3 $\frac{3}{4}$ % Nt.	2/15/66	3-9	3,114	Rights	3.68	.14
5/15/62	3 $\frac{3}{4}$ % Bd.	11/15/71	9-6	1,204	Rights	3.94	.07
8/15/62	4 $\frac{1}{2}$ % Bd.	2/15/69	6-6	1,844	Cash rfdg.	4.00	.09
11/15/62	4 $\frac{1}{2}$ % Bd.	2/15/72	9-3	2,344	Rights	4.00	.08
2/15/63	3 $\frac{3}{4}$ % Bd.	8/15/68	5-6	2,490	Rights	3.75	.09
6/20/63	4 $\frac{1}{2}$ % Bd.	8/15/70	7-2	1,906	New cash	4.00	.11
5/15/64	4 $\frac{1}{4}$ % Bd.	5/15/74	10-0	1,532	Rights	4.25	.02
5/17/65	4 $\frac{1}{4}$ % Bd.	5/15/74	9-0	2,062	Rights	4.22	.07
8/13/65	4 $\frac{1}{2}$ % Bd.	2/15/69	3-6	1,884	Rights	4.17	.09
2/15/66	5 $\frac{1}{2}$ % Nt.	11/15/70	4-9	2,839	Rights	5.00	.10
8/15/66	5 $\frac{1}{4}$ % Nt.	5/15/71	4-9	2,578	Rights	5.25	.11
11/15/66	5 $\frac{1}{2}$ % Nt.	11/15/71	5-0	1,734	Cash rfdg.	5.375	.105
Total, or average, May 1960-Nov. 1966			5-7	44,905		4.15	.10
Advance refundings							
6/23/60	3 $\frac{3}{4}$ % Nt.	5/15/64	3-11	3,893	Junior	4.24	.20
	3 $\frac{3}{4}$ % Bd.	5/15/68	7-11	320	Junior	4.14	.10
3/30/61	3 $\frac{3}{4}$ % Bd.	11/15/67	6-8	3,604	Junior	3.75	.14
	3 $\frac{3}{4}$ % Bd.	11/15/66	5-8	2,438	Junior	3.63	.07
3/9/62	4 $\frac{1}{2}$ % Bd.	8/15/71	9-5 $\frac{1}{2}$	2,805	Junior	4.104	.10
9/20/62	3 $\frac{3}{4}$ % Nt.	8/15/67	4-11	5,282	Pre.	3.809	.17
	4 $\frac{1}{2}$ % Bd.	8/15/72	9-11	2,579	Pre.	4.06	.12
3/15/63	3 $\frac{3}{4}$ % Nt.	2/15/67	3-11	4,287	Pre.	3.645	.15
	3 $\frac{3}{4}$ % Bd.	11/15/71	8-8	1,515	Pre.	3.965	.09
9/18/63	3 $\frac{3}{4}$ % Bd.	11/15/68	5-2	1,591	Pre.	4.02	.08
	4 $\frac{1}{2}$ % Bd.	9/15/73	9-11	3,894	Pre.- and Jr.	4.147	.13
1/29/64	4 $\frac{1}{2}$ % Bd.	8/15/70	6-6 $\frac{3}{4}$	2,223	Pre.- and Jr.	4.155	.105
7/24/64	4 $\frac{1}{2}$ % Bd.	10/1/69	5-2 $\frac{3}{4}$	3,726	Pre.- and Jr.	4.07	.085
	4 $\frac{1}{2}$ % Bd.	11/15/73	9-3 $\frac{3}{4}$	4,357	Pre.- and Jr.	4.229	.09
1/19/65	4 $\frac{1}{2}$ % Bd.	2/15/70	5-1	4,381	Pre.- and Jr.	4.175	.085
	4 $\frac{1}{4}$ % Bd.	2/15/74	9-1	3,130	Pre.- and Jr.	4.238	.06
2/15/66	5 $\frac{1}{2}$ % Nt.	11/15/70	4-9	4,836	Pre.	4.976	.075
8/15/66	5 $\frac{1}{4}$ % Nt.	5/15/71	4-9	1,687	Pre.	5.236	.12
Total, or average, June 1960-Aug. 1966			6-5	56,548		4.106	.11

APPENDIX TABLE 19 ESTIMATED COST OR SAVINGS IN ADVANCE REFUNDINGS—ELIGIBLE ISSUES MATURING BEFORE DECEMBER 31, 1966

Assumption "A" — Interest savings from eligible-issue maturity to maturity of offered issue based on market yield on issue when remainder of eligible issue was refunded at maturity.¹

Assumption "B" — Same as "A" except when market rate on offered issues longer than 5 years was over 4½ per cent.²

Year	Eligible issue	Number of advance refundings involved	Total estimated refundings (in millions of dollars)	Estimated budget cost or savings (in millions of dollars)				Discounted values of cost or savings (in millions of dollars)			
				Added cost to eligible-issue maturity	Savings under assumption "A"	Net savings, under assumption "A"	Savings under assumption "B"	Net savings, under assumption "B"	Added cost to eligible-issue maturity	Savings under assumption "B"	Net savings, under assumption "B"
1961	2½% Bd. 11/15/61	1	4,214	74.0	-6.4	-80.4	-6.4	-80.4	71.6	-5.9	-77.5
1962	2½% Bd. 6/15/59-62	1	1,206	22.3	15.1	-7.2	15.1	-7.2	21.6	13.0	-8.6
	2½% Bd. 12/15/59-62	1	1,177	24.8	9.6	-15.2	9.6	-15.2	23.7	8.2	-15.5
1963	2½% Nt. 2/15/63	2	2,483	28.7	-7.2	-28.6	-7.2	-28.6	25.7	-7.3	-26.0
	3½% Nt. 2/15/63	1	1,142	2.0	-7.8	-17.6	-7.8	-17.6	2.0	-6.8	-8.8
	3½% Ctl. 5/15/63	1	1,402	6.1	1.2	-4.9	1.2	-4.9	6.0	1.0	-5.0
	3½% Nt. 5/15/63	1	2,021	8.9	1.8	-7.1	1.8	-7.1	8.8	1.5	-7.3
	4% Nt. 5/15/63	1	560	2	-2.3	-2.5	-2.3	-2.5	2	-2.0	-2.0
	2½% Bd. 8/15/63	2	5,294	66.0	70.6	4.6	70.6	4.6	63.3	62.2	-1.1
	3½% Ctl. 8/15/63	1	1,670	2.5	15.5	13.0	15.5	13.0	2.5	13.7	11.2
	3½% Ctl. 11/15/63	1	302	1.3	4.2	2.9	4.2	2.9	1.3	3.7	2.4
1964	3½% Bd. 2/15/64	2	2,219	29.6	37.2	7.6	37.1	7.5	28.5	31.2	2.7
	3½% Ctl. 5/15/64	1	1,495	8.3	38.5	30.2	13.5	6.2	8.1	12.6	4.5
	4½% Nt. 5/15/64	1	1,616	2.0	9.0	11.0	1.9	3.9	1.9	11.5	3.6
	3½% Nt. 8/15/64	2	2,110	2.3	21.5	19.2	8.6	6.3	2.2	7.9	5.7
	3½% Nt. 11/15/64	2	1,616	-2.2	9.7	7.5	2.5	2.3	-2.2	1.6	-3.7
	4½% Bd. 11/15/64	2	927	-2.8	3.9	6.7	-1.3	1.5	-2.8	.8	3.6
1965	2½% Bd. 2/15/65	3	4,730	64.2	81.6	17.4	46.6	-17.6	58.8	38.4	-20.4
	4½% Nt. 5/15/65	1	1,297	-1.4	.8	2.2	2.2	1.5	-1.3	1.3	1.3
	3½% Nt. 5/15/65	1	1,356	3.5	15.0	11.5	6.4	2.9	3.4	4.4	1.0
	3½% Nt. 11/15/65	2	1,669	10.8	55.1	44.3	28.6	17.8	10.4	24.9	14.5
	4½% Nt. 11/15/65	1	461	.8	13.5	12.7	6.1	5.0	.8	5.3	4.5
1966	3½% Nt. 2/15/66	3	4,192	32.4	229.0	196.6	171.5	139.1	31.1	148.3	117.2
	3½% Bd. 2/15/66	4	2,483	14.2	102.8	98.6	75.1	50.9	4.0	48.5	44.5
	3½% Nt. 5/15/66	1	1,230	14.1	12.8	-2.8	-2.8	-2.8	13.0	4.0	1.2
	3% Bd. 8/15/66	2	785	14.0	59.1	45.1	34.3	20.3	13.0	28.0	15.0
	4½% Nt. 8/15/66	3	3,734	6.6	125.9	119.3	79.9	73.3	6.1	68.6	62.5
	3½% Bd. 11/15/66	2	1,172	12.5	67.8	55.3	46.2	33.7	11.6	37.6	26.0
	4½% Nt. 11/15/66	1	584	-2.2	5.3	5.3	5.3	5.3	-3.3	5.0	5.3
	4½% Ctl. 11/15/66	1	517	.1	4.7	4.6	4.7	4.6	.1	4.2	4.1

¹ Based on difference between market yield plus 0.12 per cent and the coupon rate (effective) on the offered issue.

² If over 4½ per cent, the length of the offered issue was limited to 5 years, but could be longer if not over 4½ per cent.

³ Cost and savings discounted at 3.5 per cent, the average yield on marketable issues during the period June 30, 1957, through 1966.

APPENDIX TABLE 20
TYPES OF EXCHANGE AND ADJUSTMENT (BOOT) PAYMENTS IN ADVANCE REFUNDINGS, 1960-66

Types of exchange: Nontaxable, recognition of gains or losses postponed;
 Taxable, immediate recognition

In millions of dollars

Advance refunding date	Total exchanges						Exchanges by the public					
	Nontaxable			Taxable ¹			Nontaxable			Taxable ¹		
	No boot	Boot paid to investor	Boot paid by investor	Boot paid to investor	Boot paid by investor	Total	No boot	Boot paid to investor	Boot paid by investor	Boot paid to investor	Boot paid by investor	Total
Amounts exchanged												
1960—June.....	4,214	...	...	...	...	4,214	4,077	...	...	...	...	4,077
Oct.....	3,979	...	...	...	...	3,979	3,395	...	...	...	...	3,395
1961—Mar.....	4,864	...	1,177	...	...	6,041	4,623	...	819	...	...	5,442
Sept.....	1,909	...	1,849	...	...	3,757	1,519	...	1,307	...	...	2,826
1962—Mar.....	1,334	...	3,867	...	...	5,201	1,269	...	2,908	...	...	4,176
Sept.....	7,860	...	...	...	...	7,860	7,519	...	...	...	...	7,519
1963—Mar.....	251	7,544	210	...	...	8,005	251	7,331	98	...	...	7,680
Sept.....	6,742	...	...	...	...	6,742	6,548	...	...	...	...	6,548
1964—Jan.....	...	2,262	708	...	...	2,971	...	1,999	657	...	...	2,657
July.....	...	5,359	782	2,947	196	9,284	...	5,338	777	2,947	196	9,258
1965—Jan.....	...	5,028	2,931	1,167	641	9,765	...	4,596	2,661	1,166	641	9,063
1966—Feb.....	...	...	...	...	4,836	4,836	...	...	...	...	4,737	4,737
Aug.....	...	...	...	...	1,687	1,687	...	...	...	...	1,674	1,674
Total.....	14,642	36,706	11,524	4,114	7,360	74,343	13,615	34,848	9,227	4,113	7,248	69,053
Boot paid												
												(Net to investor)
1960—June.....	...	...	...	...	...	...	...	...	...	...	...	...
Oct.....	...	...	...	...	...	...	...	...	...	...	...	...
1961—Mar.....	...	...	3.5	...	...	-3.5	...	2.5	...	...	...	-2.5
Sept.....	...	24.0	33.1	...	...	-9.1	...	19.9	21.6	...	...	-1.7
1962—Mar.....	...	...	50.9	...	...	-50.9	...	39.4	...	...	...	-39.4
Sept.....	...	37.0	...	...	...	37.0	...	34.8	...	...	...	34.8
1963—Mar.....	...	41.2	1.1	...	...	40.1	...	38.6	.5	...	...	38.1
Sept.....	...	75.8	...	...	...	75.8	...	73.3	...	...	...	73.3
1964—Jan.....	...	22.6	2.2	...	...	20.4	...	18.9	1.9	...	...	17.0
July.....	...	26.4	2.5	17.2	.2	40.9	...	26.3	2.4	17.2	.2	40.9
1965—Jan.....	...	20.7	9.7	7.2	1.6	16.6	...	19.0	8.8	7.2	1.6	15.8
1966—Feb.....	...	...	...	...	19.8	-19.8	...	...	...	...	19.4	-19.4
Aug.....	...	...	...	...	5.8	-5.8	...	...	...	...	5.7	-5.7
Total.....	...	247.7	103.0	24.4	27.4	141.7	...	230.8	77.1	24.4	26.9	151.2

¹ Boot paid in all taxable exchanges.

NOTE.—Figures may not add to totals due to rounding.

APPENDIX TABLE 21
MARKET YIELDS ON FEDERAL AGENCY AND TREASURY ISSUES AT CONSTANT
MATURITIES, AND REOFFERING RATES ON NEW CORPORATE BONDS —
SELECTED DATES, 1963-66

In per cent per annum

Date	1 year			5 years			10 years			New Aa corporate ¹
	Agency	Treasury	Spread	Agency	Treasury	Spread	Agency	Treasury	Spread	
1963—Feb. 28	3.22	3.02	.20	3.88	3.68	.20	4.08	3.94	.14	4.26
Apr. 8	3.26	3.09	.17	3.89	3.72	.17	4.08	3.97	.11	4.31
July 29	3.76	3.48	.28	4.08	3.87	.21	4.18	3.99	.19	4.35
Oct. 31	3.88	3.68	.20	4.13	4.01	.12	4.24	4.15	.09	4.38
1964—Mar. 10	4.08	3.90	.18	4.28	4.11	.17	4.32	4.20	.12	4.46
Apr. 6	4.15	3.95	.20	4.58	4.19	.39	n.a.	4.22	n.a.	
May 28	4.04	3.84	.20	4.27	4.03	.24	4.33	4.19	.14	4.47
July 29	3.98	3.71	.27	4.25	4.05	.20	4.31	4.20	.11	4.43
Sept. 23	4.02	3.82	.20	4.24	4.06	.18	4.32	4.19	.13	4.51
Oct. 13	4.10	3.86	.24	4.30	4.08	.22	4.33	4.19	.14	4.48
Nov. 6	4.08	3.86	.22	4.28	4.04	.24	4.37	4.15	.22	4.48
1965—Mar. 26	4.27	4.04	.23	4.33	4.14	.19	4.34	4.20	.14	4.49
June 4	4.35	4.03	.32	4.42	4.15	.27	4.44	4.23	.21	4.58
Sept. 24	4.47	4.31	.16	4.54	4.29	.25	4.56	4.31	.25	4.71
Nov. 23	4.58	4.38	.20	4.71	4.45	.26	4.68	4.45	.23	4.80
1966—Jan. 26	5.05	4.88	.17	5.08	4.91	.17	4.94	4.61	.33	4.95
Feb. 23	5.29	4.98	.31	5.28	5.00	.28	5.08	4.92	.16	5.18
Mar. 11	5.34	5.05	.29	5.34	4.99	.35	5.22	4.96	.26	5.30
Apr. 22	5.38	4.89	.49	5.16	4.83	.33	5.04	4.77	.27	5.30
June 6	5.70	5.03	.67	5.30	4.96	.34	5.25	4.79	.46	5.64
June 24	5.61	4.85	.76	5.33	4.94	.39	5.25	4.80	.45	....
July 8	5.74	5.15	.59	5.52	5.09	.43	5.48	4.99	.49	5.82
Aug. 30	6.36	5.97	.39	6.14	5.85	.29	6.22	5.48	.74	6.35
Oct. 11	6.00	5.58	.42	5.58	5.29	.29	5.52	5.05	.47	6.04
Nov. 28	6.10	5.48	.62	5.62	5.35	.27	5.37	5.19	.18	6.15
Dec. 29	5.47	5.00	.47	5.22	4.80	.42	5.13	4.60	.53	5.86

¹ Average of weekly reofferings as estimated by the U.S. Treasury.
n.a. Not available.

EXAMPLES OF TAX TREATMENT OF ADJUSTMENT (BOOT) PAYMENTS ¹

Where a bond is offered by the Treasury with a payment (other than the accrued interest adjustment) to the investor.

Examples:

1. Assume that:

- The fair market value of the security offered by the Treasury on the date the subscription is submitted is \$99.00 (per \$100 face value).
- The payment to the subscriber (discount) on account of \$100 issue price is \$0.50.
- The cost basis of the security surrendered by the subscriber is \$99.75 (per \$100 face value).

The sum of the fair market value of the security offered by the Treasury and the payment to the subscriber is \$99.00 + \$0.50 or \$99.50. This is less than the cost basis of the issue surrendered, therefore, no gain is recognized. The new issue will be entered on the books of the subscriber at a cost basis of \$99.25, the cost basis of the issue surrendered less \$0.50. The gain or loss between this cost basis and the proceeds of a subsequent sale or redemption of the new issue will be a capital gain or loss to all investors, except those to whom the bonds are stock in trade. Under present law, if the combined time that the security surrendered and the new security received in exchange were held exceeds 6 months, the capital gain or loss is long term, otherwise it is short term.

- The assumptions are the same except that the cost basis on the books of the subscriber of the security surrendered is now \$99.25 (per \$100 face value) instead of \$99.75 in example 1.

The sum of the fair market value of the new security received in exchange by the subscriber plus the \$0.50 payment (discount) is again \$99.50. This exceeds the cost basis of the security surrendered by \$0.25. This excess is a recognized gain reportable for the year in which the exchange takes place. The gain is a capital gain except to those to whom the bonds are stock in trade. Under present law, if the time the security surrendered was held exceeds 6 months, the capital gain is long term, otherwise it is short term.

The subscriber will carry the new issue received in exchange at a cost basis equal to the basis of the issue surrendered (\$99.25), less the payment (\$0.50), plus the amount of the recognized gain (\$0.25), or \$99.25 - \$0.50 + \$0.25 \$99.00.

- The assumptions are the same as in example 1, except that the cost basis on the books of the subscriber, of the security surrendered is \$98.75 (per \$100 face value) instead of \$99.75 in example 1.

The sum of the fair market value of the new issue received in exchange by the subscriber plus the \$0.50 payment (discount) is still \$99.50. This exceeds the \$98.75 cost basis by more than \$0.50. However, the amount of the gain reportable for the year of the exchange is \$0.50, since the amount of gain recognized cannot exceed the amount of the payment. The nature of the recognized gain and its treatment is the same as in example 2. In this case, the subscriber will enter the new security received in exchange on his books at the same cost basis as the security surrendered.

¹ Examples are those contained in Appendix to Paragraph No. 9, "Nonrecognition of Gain or Loss for Federal Income Tax Purposes."

in Treasury release on advance refunding offer announced Feb. 20, 1963.

EXCERPT FROM ADVANCE REFUNDING OFFER OF FEB. 20, 1963

12. Explanation of minimum reinvestment rate for the extension of maturity in advance refunding¹

A holder of the outstanding eligible securities had the option of accepting the Treasury's exchange offer or of holding them to maturity. Consequently, he can compare the interest, plus (or minus) any payment, other than the adjustment of accrued interest, he will receive resulting from exchanging now with the total of the interest on the eligible issues and what he might obtain by reinvesting the proceeds of the eligible securities at maturity.

The income before tax for making the extension now through exchange will be the coupon rates plus (or minus) any payment on the new issues. If a holder of the eligible securities does not make the exchange he would receive the coupon rates on the eligible issues to their maturity and would have to reinvest at that time at a rate equal to that indicated in paragraph 13 below for the remaining terms of the issues now offered, in order to

equal the return (including any payment) he would receive by accepting the exchange offer. For example, if the 3 $\frac{1}{2}$ % bonds of 2/15/64 are exchanged for 3 $\frac{1}{4}$ % bonds of 11/15/71 the investor receives 3 $\frac{3}{8}$ % interest for the entire eight years and eight months plus \$70 (per \$100 face value) immediately. If the exchange is not made, a 3 $\frac{1}{2}$ % rate will be received until February 15, 1964, requiring reinvestment of the proceeds of the 3 $\frac{1}{2}$ % of 1964 at that time at a rate of at least 4.11%, for the remaining seven years and nine months, all at compound interest, to average out to a 3 $\frac{3}{8}$ % rate for eight years and eight months plus the \$70 immediate payment. This minimum reinvestment rate of the extension period is shown in the table under paragraph 13. The minimum reinvestment rates for the other issues included in the exchange are also shown in the table under paragraph 13.

¹ Paragraph 12 of Treasury release on advance refunding offer announced Feb. 20, 1963.

13. Investment rates on the new notes and bonds offered in exchange to holders of the eligible securities¹

Eligible securities	3 $\frac{1}{2}$ % C.I. 8/15/63	2 $\frac{1}{2}$ % Bonds 8/15/63	3 $\frac{1}{4}$ % C.I. 11/15/63	3% Bonds 2/15/64	3 $\frac{1}{2}$ % Notes 11/15/65	3 $\frac{3}{8}$ % Notes 2/15/66	3% Bonds 8/15/66	3 $\frac{3}{8}$ % Bonds 11/15/66
FOR THE NEW 3 $\frac{3}{8}$ % NOTES OF FEB. 15, 1967								
Payments on account of \$100 issue price to subscriber	\$0.50	\$0.10	\$0.30	\$0.10				
Approximate investment yield from exchange date (3/15/63) to maturity of notes offered in exchange based on price of securities eligible for exchange ²	3.65%	3.65%	3.64%	3.63%				
Approximate minimum reinvestment rate for the extension period ³	3.80	3.80	3.84	3.87				
FOR THE NEW 3 $\frac{7}{8}$ % BONDS OF NOV. 15, 1971				FOR THE NEW 3 $\frac{3}{8}$ % BONDS OF NOV. 15, 1974				
Payments on account of \$100 issue price to subscriber	\$1.10	\$0.70	\$0.90	\$0.70	\$1.50	\$1.70	...	\$0.90
Approximate investment yield from exchange date (3/15/63) to maturity of bonds offered in exchange based on price of securities eligible for exchange ²	3.97%	3.97%	3.96%	3.96%	3.98%	3.98%	3.97%	3.97%
Approximate minimum reinvestment rate for the extension period ³	4.05	4.06	4.08	4.11	4.24	4.24	4.33	4.32
FOR THE NEW 4% BONDS OF FEB. 15, 1980								
Payments on account of \$100 issue price:								
By subscriber	\$0.90	\$0.50	\$0.70	\$0.50	\$1.00	\$1.20	\$0.50	\$0.40
To subscriber								
Approximate investment yield from exchange date (3/15/63) to maturity of bonds offered in exchange based on price of securities eligible for exchange ²	4.04%	4.04%	4.04%	4.03%	4.04%	4.04%	4.03%	4.03%
Approximate minimum reinvestment rate for the extension period ³	4.09	4.10	4.11	4.12	4.23	4.24	4.30	4.29

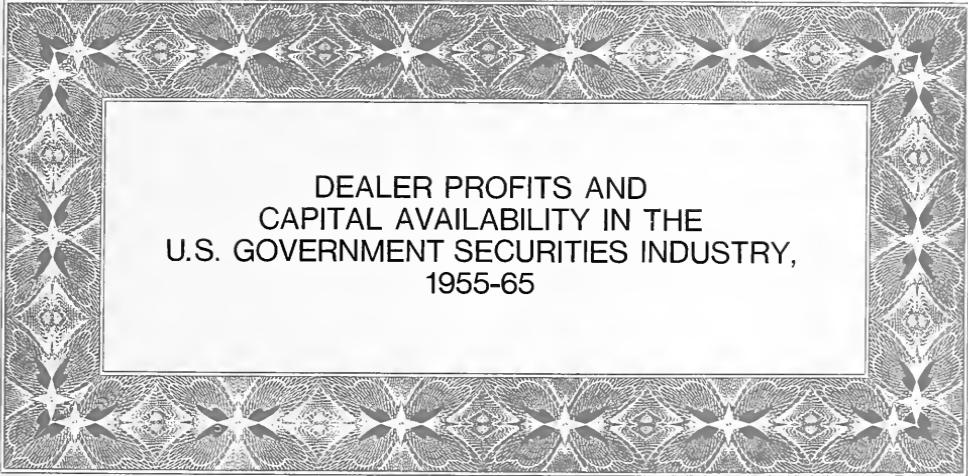
¹ Paragraph 13 of Treasury release on advance refunding offer announced Feb. 20, 1963.

² Yield to nontaxable holder or before tax. Based on mean of bid

and asked prices (adjusted for payments on account of issue price) at noon on Feb. 19, 1963.

³ Rate for nontaxable holder or before tax. For explanation see paragraph 12 above.





DEALER PROFITS AND
CAPITAL AVAILABILITY IN THE
U.S. GOVERNMENT SECURITIES INDUSTRY,
1955-65

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I. INTRODUCTION

For the 5 years 1961-65, average annual profits from dealer operations in U.S. Government securities fell substantially below the level attained in the previous 5-year period.¹ This decline culminated in a net loss of more than \$14 million in 1965, when only 3 of 20 dealers reported a profit from these operations. This deterioration has caused some concern about the maintenance of a strong dealer industry and has brought into question the effects of increased competition resulting from the entrance of additional dealers over the past few years as well as from recent innovations in official policies and operations.

The task of this study is twofold: (1) to specify and evaluate the factors bearing on dealer profitability, such as changing economic circumstances, industry structure, and operating techniques utilized by the Federal Reserve and the Treasury; and (2) to ascertain the sufficiency of dealer capital under current market conditions, with a view to judging whether the industry will have sufficient capital so that it can continue to "make markets" and to absorb large official operations.

The discussion in this paper is based largely on the operations of nonbank dealers owing to the less complicated nature of their activities and the existence of more reliable profit data for them; any known or suspected variations in bank dealer operations or behavior are noted. Both the description and the evaluation of dealer profit performance are severely constrained by the fragmentation and inadequacies of the data and by the absence of clear and consistent definitions underlying the data compilation. Many of the dealer data presented are meant to give some indication of the magni-

tude and direction of certain measurable aspects of dealer profits and related variables. The limitations of the data are numerous; to avoid excessive detail, only the more important qualifications are described.

Data on dealer income have been gathered from three sources. Differing in their construction and coverage, these disparate series present the most serious constraint to meaningful interperiod income analysis. One source is the study of the Government securities market made by Meltzer and von der Linde, which records various annual income and expense figures, including net profits, for "all reporting dealers" (bank and nonbank) for the 11 years 1948-58.² This series covers earnings and expenses on all types of securities operations for the diversified nonbank dealers but covers only the U.S. Government securities operations of banks. Details on reporting procedures and methods of allocating income and expenses are absent. The series includes the 5 bank dealers and the 12 nonbank dealers trading with the Federal Reserve Open Market Account in 1958;³ however, that was not the exact group of "authorized" dealers in each of the 11 years, as is noted in the discussion of dealer capital.

A second source of profits data is an unpublished study of the Government securities market by Dr. George Benston, conducted

² U.S. Congress, Joint Economic Committee, *A Study of the Dealer Market for Federal Government Securities*; report written by Allan H. Meltzer and Gert von der Linde, Joint Committee Print (Washington, D.C.: Government Printing Office, 1960).

³ The 17 dealers were: Bankers Trust Company, New York; Chemical Bank New York Trust Company; Continental Illinois National Bank and Trust Company of Chicago; The First National Bank of Chicago; Morgan Guaranty Trust Company of New York; Barlow Leeds & Co.; Briggs, Schaedle & Co., Inc.; C. F. Childs & Co., Inc.; C. J. Devine & Co.; Discount Corporation of New York; The First Boston Corporation; Aubrey G. Lanston & Co., Inc.; New York Hanseatic Corporation; Wm. E. Pollock & Co., Inc.; Chas. E. Quincey & Co.; D. W. Rich & Company, Inc.; and Salomon Bros. & Hutzler.

¹ In this paper, virtually all references to dealer operations in U.S. Government securities include operations in Federal agency securities and, commencing in 1961, certificates of deposit. Where data include operations in bankers' acceptances and municipal and corporate securities, which are undertaken by many dealer firms, specific note is made.

under the auspices of the Banking and Currency Committee of the House of Representatives. In this study, data for the Government securities operations of individual firms were collected on a monthly basis from 1958 to 1963; here, too, procedural and allocative details are missing. This series was the only one with sufficient observations to permit statistical analysis, which was undertaken despite known shortcomings in the data. Because of the inability of most dealers to separate trading profits from interest income on Treasury bills, and the differences among dealers in classifying a number of income and expense components, the series used for measuring profits is "trading profits plus carry." ("Carry" is defined as the difference between interest earned on securities held in position and the interest cost of financing them. This difference, or "net carry," may be positive or negative.) Use of this com-

bined profit concept, and the absence of trading profit (or carry) data for bills as contrasted with coupon securities, may seriously bias the statistical analysis.

Finally, partially disaggregated data for individual dealers are available for operations in U.S. Government securities from the reporting program initiated for nonbank dealers in 1964 and for bank dealers in 1965 by the Market Statistics Division of the Federal Reserve Bank of New York. Although these figures cannot be directly related to the earlier series, they are a more reliable and detailed statement of actual profit performance. A short analysis of aggregate income statements for these 2 years is presented in the Appendix. Again, the inability to segregate trading profits on Treasury bills from interest accruals, plus diverse allocative practices, precludes exact inter-firm comparisons of trading or carry.

II. SUMMARY

PROFITS

The sharply deteriorating trend in earnings of U.S. Government securities dealers from 1961 through late 1966, after several extremely successful years, has been offered as evidence that public and private innovations in financial markets have been detrimental to the profitability of the industry. This deterioration led to some concern about the future effectiveness of the industry in accommodating public (official) and private activity in the market. This study examined the effects of such innovations, as well as the impact of the economic and institutional environment of the past decade, on aggregate profits of dealers, and it reached the following conclusions:

1. A longer view of dealer profit performance, from the late 1940's, reveals a strong cyclical pattern of earnings. This suggests that the recent low levels were not abnormally below those of other periods at the same stage in the business cycle. The principal feature of the early 1960's was the extended and uninter-

rupted interval of economic expansion, which was accompanied by generally rising and, perhaps more importantly, nonvolatile interest rates.

2. The sharp reduction in dealer profits for 1961-65 inclusive can be attributed in great measure to the negative effects of cyclically declining securities prices on dealer positions as monetary conditions tightened. Treasury bill yields rose in each year of this period, and long-term bond yields moved higher in every year but 1962. (In that year, there was some improvement in dealer earnings.) Furthermore, with trading activity in long-term securities observed to move inversely with monetary tightness, a declining volume of transactions in coupon issues after 1963 led to reduced opportunities for profits on turnover. Finally, as the differential between long- and short-term interest rates narrowed with higher rate levels, the tendency for profitable carry was minimized and eventually eliminated. At this writing, sufficient data are not available for a com-

plete analysis, although early reports indicate that 1966, with the abrupt drop in security yields late in the year, was a very profitable period for dealers; this fact lends support to the hypothesis that cyclical monetary conditions have dominated the profit performance of dealers.

3. In assessing long-term profitability of dealers, the effects of innovations in financial markets by public and private sectors become increasingly important. Both sectors may have contributed to the most notable change—namely, the nature of the business cycle itself. The well-defined and relatively short cycle of the 1950's has been supplanted by a new pattern, as yet perhaps not entirely visible or identifiable. If this pattern persists, it will represent a changed environment for dealer operations and one to which dealers must attempt to adjust. Such a pattern may mean, for example, that a longer period of meager returns will be followed by a relatively short but highly profitable interval, with it becoming imperative for dealers to be able to identify promptly the turning point.

One aspect of the changed cyclical environment that was apparently harmful to dealer earnings, though unquestionably valuable on broader grounds, was the stability of interest rates. Not only do bid-asked spreads tend to narrow with diminished volatility of rates—making transactions less profitable—but also gains from intracyclical price fluctuations (through appropriate, well-timed position adjustments) may decline.

4. It is difficult to measure the extent to which public innovation, in the broad sense of new and evolving fiscal and monetary action and debt management, guided the prolonged expansion—and in doing so, how it affected dealer expectations and their perception of market risks. Whether these essentially exogenous decisions reduced or increased uncertainties about rate movements and thus hindered or helped dealer profits is unclear. Available evidence suggests that dealers were less successful in adjusting positions in anticipation of price changes in the 1960's than in the late

1950's. Still, when a major rate reversal occurred in late 1966, dealers reacted swiftly and accurately.

5. Developments in the private sector tended to affect dealer profits adversely. The greater mobility and sensitivity of investible funds, inherent in the growth of Federal funds activity and in the expanded use of certificates of deposit (CD's), contributed to a flattening of yield curves and to a relatively higher rate structure for financing positions. Both uses competed directly for funds that otherwise might have been available more cheaply to finance dealer positions. Furthermore, the increased competition of these instruments for short-term funds undoubtedly aggravated the pressure on dealers to reduce quoted spreads for short-maturity U.S. Government securities.

During the early 1960's, there was an apparent increase in competition among dealers arising from the entry of three new bank dealers and the "net" entry of one sizable nonbank dealer. This expansion in numbers may have contributed to the increased pressure on spreads and reduced the existing dealers' shares of the rising volume of transactions.

CAPITAL

This study also investigated whether adequate capital would be available to accommodate future market operations, in light of the past deterioration in profits. Insufficient capital would act as a constraint on the desired expansion of positions and on the concomitant willingness of dealers to assume the risks associated with large positions. A circumstance of insufficient capital is presumably detrimental to efficient and effective market performance in accommodating public and private operations. This study found that the amount of capital possessed by nonbank dealers (that is, capital sufficiently liquid to satisfy margin requirements) plus the amount of funds potentially available to bank dealers is far in excess of any possible needs in the foreseeable future.

Estimated minimum capital requirements (for positioning daily-average gross long posi-

tions of \$4.6 billion in 1965) were about \$42 million. Of this total, nonbank dealer positions "required" \$29 million. These dealers reported aggregate invested capital of \$261 million in 1965 and had allocated \$86 million of the total to support their positions. It is reasonable to assume that the amount of nonbank dealers' capital that could conceivably be employed as margins is, at the least, considerably more than \$100 million.

Bank dealers, who accounted for approximately one-third of estimated minimum margin requirements, in fact are not subject to such capital requirements since the bulk of their positions are financed with their own funds. These funds may be augmented readily through borrowing in the Federal funds market and by issuing CD's. In short, the amount of capital potentially available for margining securities is enormous and for the industry as a whole is not a realistic constraint on the expansion of positions.

The adverse trend in earnings in the early 1960's certainly had no perceptible effect on capital investment except to the extent that

low profits slowed the growth in capital of existing dealers. In fact, three new banks and two nonbank firms entered the industry. The departures by two nonbank dealers were for reasons unrelated to market performance. The willingness of both old and new dealers to commit their available capital to expand positions, however, is largely unrelated to the amount available. For both nonbank dealers and bank dealers, such funds tend to be liquid and mobile and may be shifted readily to activities that provide greater opportunities for profitable employment.

Even if alternative uses did not exist, "dormant" capital may be less costly than capital used to expand positions under unfavorable circumstances. If expected profits in U.S. Government securities operations are exceeded by potential gains in other activities, or if they are not sufficient to compensate for the risks of making markets, dealers are unlikely to commit capital to positioning Government securities. Nevertheless, there is no doubt that ample capital will be forthcoming if expected profits justify its utilization.

III. DEALER PROFIT PERFORMANCE

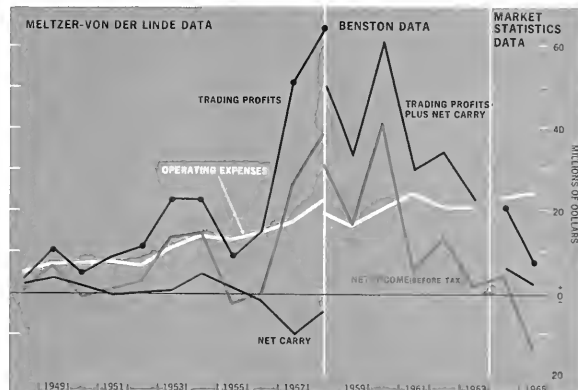
This section describes the elements of dealers' income and expenses and then explores the impact of postulated relationships between selected exogenous variables and observed profit performance. The testing of these relationships utilizes both visual and regression analyses.

The behavior of net income and of its underlying components—trading profits, carry, and operating expenses—may be reviewed briefly. The data, presented in Chart 1 and also in Table 1, are linked for the three successive series despite several discrepancies. The Meltzer-von der Linde data cover, as previously noted, all operations of participating nonbank dealers whereas the other two series reflect only the Government securities operations. Net carry, in the Benston figures, had to be combined with trading profits because sev-

eral dealers reported their income on bills with trading profits while others included it with interest earned. In any event, it was impossible to obtain valid estimates of annual net carry throughout the entire 1948-65 interval because of the problem of separating trading profits from interest earned on bills.

For both the Meltzer-von der Linde and Benston series, gaps in the figures submitted by individual dealers, particularly with regard to operating expenses, necessitated interpolation of data for subgroups of dealers in order to arrive at aggregate income and expense levels. In 1964, as noted earlier, bank dealer data were not collected at all. The industry figures shown in Table 1 include estimates for income and expenses of bank dealers; these estimates are based on nonbank dealer figures and on data obtained informally from several dealer banks.

1 INCOME AND EXPENSES OF U.S. GOVERNMENT SECURITIES DEALERS, 1948-65



NOTE.—For description and coverage of series, see Table 1.

Despite these shortcomings, certain conclusions may be drawn from the linked series. First, it is evident that trading profits have been the primary determinant of net income and that their extreme volatility has led to wide fluctuations in the level of net income.⁴ Trading profits, in turn, appear to move inversely with the business cycle. Years in which trading profits were high were generally associated with recessions and declining interest rates, and years of low returns with expansion and rising rates. Furthermore, in years when trading profits were low the industry as a whole often sustained net losses, as in 1950, 1955, 1965, and perhaps in 1948 and 1956 if profits for Government securities operations alone are considered.

Second, profits in the peak years—1957, 1958, and 1960—appear as a hump in the earnings picture rather than as the culmination of a well-defined and subsequently reversed trend. Thus it may be misleading to compare and contrast profits in only the two halves of

the 10 years from 1956 to 1965. And if one uses the 5-year periods, it would seem as valid to view average earnings in the earlier 5 years as abnormally swollen as to characterize those in the 1961–65 period as unusually poor.

THE INCOME EQUATION

Broadly speaking, the net income, before taxes, accruing to dealers from Government securities operations represents the sum of trading profits and carry minus operating expenses.⁵ In order to identify the exogenous variables that influence dealer earnings and to diagnose their effect on earnings over the past decade, the elements of income and expense can be viewed as the products of independent, or possibly interdependent, components.

Trading profits, the primary element of net income, are the sum of differences between the purchase and sale price of each security sold. The purchase-sale price differential can be split conceptually into two facets: (1) the spread, which represents the bid-offer quotations at which a dealer would simultaneously

⁴ Data on the relative contributions of capital gains or losses and spreads ("turnaround" prices) to these swings in trading profits are not available. However, the behavior of these two components will be examined later.

⁵ Hereinafter, the terms "dealer" and "dealer function" refer only to the Government securities operations of participating firms.

TABLE 1: INCOME AND EXPENSES OF U.S. GOVERNMENT SECURITIES DEALERS, 1948-65

Source and coverage of data	Year	Trading profits	Net carry	Trading profits plus net carry	Operating expenses	Net income (before taxes)
In thousands of dollars						
Meltzer-von der Linde¹						
All operations of nonbank dealers; and operations in U.S. Govt. and related securities of bank dealers	1948	3,796	2,687	6,483	5,689	1,051
	1949	11,127	4,264	15,391	7,992	7,710
	1950	5,153	2,125	7,278	8,039	-319
	1951	9,721	99	9,820	8,449	1,829
	1952	11,715	1,177	12,892	7,374	3,713
	1953	23,392	1,549	24,941	11,574	14,060
	1954	23,215	5,414	28,629	14,680	14,924
	1955	9,200	1,293	10,493	13,491	-1,881
	1956	15,746	-1,315	14,431	15,333	639
	1957	32,125	-9,151	42,974	17,893	27,043
	1958	64,288	-3,827	60,461	22,960	38,840
Benston²						
Operations in U.S. Govt. and related securities of bank and nonbank dealers	1958	...	...	51,724	19,909	31,815
	1959	...	...	33,452	16,602	16,850
	1960	...	...	61,631	20,609	41,022
	1961	...	...	30,037	24,324	5,713
	1962	...	...	34,699	21,024	13,675
	1963	...	...	22,671	20,773	1,898
Market Statistics Division, Federal Reserve Bank of New York³						
Operations in U.S. Govt. and related securities of bank and nonbank dealers	1964	21,100	6,400	27,500	23,300	4,300
	1965	7,304	2,333	9,637	24,238	-14,346

¹ Data are for the 12 nonbank dealers and the 5 bank dealers authorized to trade with the System Open Market Account in 1958. "Gross earnings" (not shown) were reported by all dealers; items in the table were extrapolated from complete reports submitted by from 8 to 13 dealers. Trading profits plus carry minus operating expenses do not equal net income because of the omission of "other earnings." Trading profits on Treasury bills were reported with interest income by most, if not all, dealers. The data are derived from the regular dealer financial statements. Since most have different fiscal years, the data for individual dealers do not cover a common time period.

² Trading profits plus carry were reported as a combined total by all dealers; the figures include "other income." Operating expenses and net income were extrapolated from complete reports of from five to eight dealers. Data are based on calendar-year reports.

³ Trading profits on Treasury bills are included in net carry. "Other income" is not shown. Data on trading profits are adjusted for unrealized capital gains and losses at the year-end. All data are based on calendar-year reports.

Income and expenses of bank dealers for 1964 are estimates based on the relation of figures for nonbank dealers to all dealers in 1965.

buy and sell a security; and (2) the capital gain or loss associated with the movement of security prices—that is, a shift in both bid and offer quotations while securities are held in position. The contribution of spread to trading profits depends upon sales volume whereas the effect of price change is contingent on the size and composition of positions at the moment such change occurs.

The second element of dealer income is carry. Again, carry income (or loss) is the product of the yield-cost differential and the amount of securities financed. At this point, no account is taken of the variations in cost among different types of financing.

The final broad element of net income is operating expense, which consists of some fixed and some variable components. Fixed ex-

penses include wages, rent, and so on, whereas variable expenses include, among others, the clearing costs associated with the delivery and safekeeping of securities. The variable component is a function of per-unit sales costs and the volume of sales. Charges are generally attached only to the sale side of transactions.

A dealer profit equation can be constructed to bring these elements into clearer focus. The first two factors relate to trading profits, the third to carry, and the fourth to operating expenses:

$$I_{it} = s_{it} S_{it} + \Delta p_{it} P_{it-1} + C_{it} P_{it-1} - b_{it} B_{it} - (F + vS)_{it}$$

where:

I_{it} = income from the i th issue during period t

s_{it} = bid-offer spread, in dollars per bond

- S_{it} = number of bonds sold in period t
 $\Delta p_{it} = p_{it} - p_{it-1}$
 p_{it} = price at end of period t , in dollars per bond
 C_{it} = coupon on i th issue, in dollars
 P_{it-1} = number of bonds held at the end of period $t-1$, net of gross long and short positions in the i th issue
 b_t = interest rate on borrowed funds during period t
 B_{it} = total funds borrowed during period t
 F = fixed expenses
 v = constant representing variable expenses

Each of these components can now be investigated separately in measuring the impact of changing exogenous variables.

TRADING PROFITS

Spread. The bid-asked spread encompasses both compensation for performing the intermediary broker service and a reward for assuming the risks of making markets. Quoted spreads for several maturity categories of securities since 1950 are presented in Table 2. It is evident that bill spreads narrowed throughout the late 1950's and continued to decline in the early 1960's while spreads on coupon securities exhibited mixed behavior. It should be noted that the spreads recorded here are announced quotations, which may vary to a greater or lesser degree from the actual or inside spreads at which trades are effected. The possibility of a discrepancy between announced and inside spreads increases as spreads widen, as they do in the case of longer-term issues.

If price changes and carry rates were presumed to be primarily cyclical phenomena, the long-term profitability of Government securities dealers would depend in great measure on the behavior of spreads. Although much detailed empirical analysis remains to be done, it is possible to suggest several factors that influence the width of security spreads.

Intuitively one would expect the service component of spread to vary inversely with the degree of competition and the level of variable

costs. The behavior of variable costs is examined in the section on operating expenses. Competition, in this case, refers both to the substitutability of alternative instruments and to the degree of competition among dealers for business. Coincident with the narrowing of bill spreads in the 1960's the number of dealers increased and the use of Federal funds and CD's as short-term investment instruments was vastly expanded. Theoretically, both of these developments should have increased the demand and supply elasticities in the market for U.S. Government securities, thereby narrowing spreads.

TABLE 2: SPREAD BETWEEN DEALERS' QUOTED BID AND ASKED PRICES ON U.S. GOVERNMENT SECURITIES, 1950-65

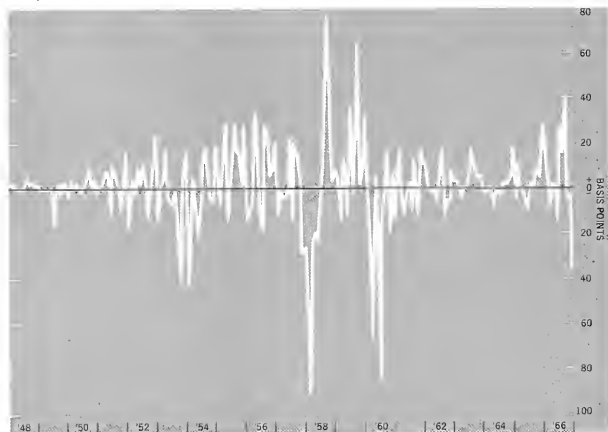
Year	3-month Treasury bills	Coupon securities maturing—			
		In 6 to 13 months	In years		
			3 to 5	5 to 10	After 10
	Basis points	Most typical spread, in 32nds			
1950	4.5	n.a.	1.5	2	2
1951	5.5	n.a.	2.25	4	3.5
1952	5.25	n.a.	2	4	4
1953	4	2	5	5	6.5
1954	3.5	2	2.75	4.5	5
1955	3.5	2	2.75	4	4
1956	3.75	2	3.5	4	4
1957	3.5	2	5	5	5
1958	3.5	2	4	7	8
1959	4	2	4.5	6	8
1960	3.75	4.5	4	8	8
1961	2.75	2.5	4	8	8
1962	2.25	2	4	8	8
1963	2	2	2.5	6	8
1964	2.25	2	3.5	4	8
1965	2.25	2	4	4	8
1950-54	4.55	2.00	2.70	3.90	4.20
1955-60	3.67	2.41	3.96	5.67	6.17
1961-65	2.30	2.10	3.60	6.00	8.00

SOURCE.—Summarized from quarterly data in Louise Ahearn and Janice Peskin, "Market Performance as Reflected in Aggregative Indicators," Part 2 of this series, p. 141.

The fact that spreads on some coupon issues widened while spreads on others narrowed in the early 1960's is ascribed primarily to altered supply conditions in various maturity categories, as noted in the discussion of spread behavior in the Ahearn-Peskin study.⁶ However, the net effect of these diverse movements on the aggregate income of dealers can be

⁶ Louise Ahearn and Janice Peskin, "Market Performance as Reflected in Aggregative Indicators," Part 2 of this series.

2 | CHANGES IN TREASURY BILL RATES, 1948-66



NOTE.—Changes derived from monthly averages of daily figures as published in the Federal Reserve Bulletin.

evaluated only in the context of the trend in sales volume for each category; this exercise is undertaken in the next section.

The second element influencing the width of spread quotations is the risk associated with making markets and maintaining positions under conditions of potential price decline and capital loss. Although risk cannot be measured directly, it should be reflected in the volatility of the short-run rate or in price changes over time. Chart 2 shows the pattern of rate volatility for 3-month bills. It is clear that volatility dropped considerably in 1961–65 compared with the late 1950's. The primary effect of reduced price fluctuation should be to lower the risks inherent in positioning securities and therefore to contract the risk component of spread. This would depress profitability, even though the expected value of price changes or the actual net price change for periods of either stability or instability might be zero.

According to many dealers, the reason for rate stability in the early 1960's was the greater control of interest rates exerted by the Federal Open Market Committee in conjunction with "operation twist." It is evident in

Chart 2 that month-to-month fluctuations in daily-average rates on 3-month bills declined sharply in 1961, when the program was initiated, and that they remained relatively stable through most of 1965. The only period of commensurate stability shown on the chart was from 1948 to 1950 when the Federal Reserve was pegging interest rates. Indeed, bill spreads were widest in the years immediately following removal of the pegs. (Reduced volatility in the 1960's is also evident in Appendix Tables 6 and 7 of the Ahearn–Peskin study; these tables record the frequency of large and small *daily* price changes.)

In examining the financial environment of the 1960's, Ettin concludes that "... more aggressive and flexible response to short-run rate movements by the Treasury and Federal Reserve contributed to a greater stability of yields."⁷ As evidence, he notes the increased use of repurchase agreements by the Federal Reserve in the 1960's—which had the effect of

⁷ Edward C. Ettin, "Financial and Economic Environment of the 1960's in Relation to the U.S. Government Securities Market," Part 2 of this series, p. 22.

eliminating sharp short-term pressures stemming from outright purchases and sales—and the greater care taken by the Treasury in the pattern and timing of its actions.

At the same time, Ettin attributes a good portion of the stability in short-term rates during the period to events and innovations in the private sector. Most important was the steady and balanced growth in output with relatively constant prices and costs, which led to expectations that interest rates would be stable. In addition, substantially expanded use of Federal funds and of CD's as short-term instruments raised the elasticities of supply and demand for Treasury securities, tending to smooth out short-run imbalances between the two.

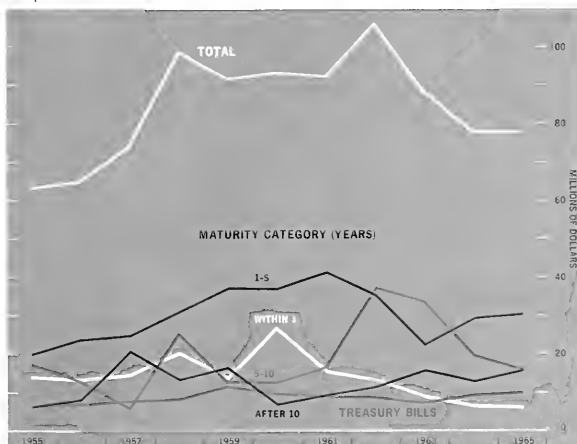
Whether behavior in the public sector contributed more to rate stability than behavior in the private sector remains to be seen. The increased sensitivity of the Treasury and the Federal Reserve to rate volatility—assuming short-term stability to be a continuing goal of policy—and the increase in the mobility of funds and the substitutability of instruments in the private sector should permanently lower

the risks associated with short-term rate movements. The circumstance of balanced growth and of expectations that rates would be steady could well have dominated rate changes in the 1960's. Needless to say, this situation may not be permanent. If not, the reduction in risk, which implies lower spreads and profits, would be only transitory.

Transactions.⁵ Linked to spread in the income equation is the volume of sales. *Ceteris paribus*, profits should be positively related to sales volume; however, the interplay of changes in spreads and of sales in various maturity categories complicates the measurement of each component. Spreads were observed to have declined for bills but widened for some longer-term coupon issues; on the other hand, sales climbed steeply for bills but behaved er-

⁵ The data on dealer transactions and positions are those utilized in other papers prepared for this study, and they are subject to the same qualifications. Of particular importance are the revisions of reporting procedures and coverage in 1960, which essentially preclude detailed interperiod (1950's versus 1960's) comparisons of transactions and position effects on profits.

3 | SPREAD PROFITS ON U.S. GOVERNMENT SECURITIES, 1955-65



NOTE.—Spread profits are the product of securities sales and of the difference between bid and asked quotations. Dealer sales were computed as one-half of daily-average transactions (Table 3), inflated to a gross annual basis.

TABLE 3: DEALERS' DAILY-AVERAGE GROSS TRANSACTIONS IN U.S. GOVERNMENT SECURITIES BY MATURITY CATEGORY, 1955-65

In millions of dollars

Year	Treasury bills	Coupon securities, by maturity (in years)				Total
		Within 1	1 to 5	5 to 10	After 10	
1955.....	520.7	168.8	159.7	93.5	39.3	982.0
1956.....	572.6	164.6	152.2	74.8	18.4	982.6
1957.....	664.8	177.0	123.8	30.3	18.0	1,013.9
1958.....	682.8	238.2	186.6	95.6	43.3	1,246.3
1959.....	829.3	164.4	225.5	49.5	21.9	1,290.6
1960.....	817.5	152.1	236.2	40.0	22.2	1,268.0
1961.....	1,036.3	167.5	265.1	53.3	29.6	1,552.3
1962.....	1,230.3	170.7	225.1	120.9	36.3	1,782.4
1963.....	1,199.6	119.6	215.8	141.1	49.9	1,726.1
1964.....	1,302.5	85.8	219.2	126.1	41.3	1,775.0
1965.....	1,400.3	78.8	194.7	102.0	49.6	1,825.4

SOURCE.—Summarized from quarterly data in Appendix Table 1 of the Ahearn-Peskin study cited in Table 2.

ratically for coupon securities.⁹ Further clouding the picture, spread profits per unit of sales are larger for long-term coupon issues than for bills—perhaps 20 to 30 times as large.

To assess the over-all trends in spread profits, dollar sales of U.S. Government securities were multiplied by quoted spreads (gross) in each maturity category.¹⁰ The results are presented in Chart 3.¹¹ The sales figures used

for the spread-profit calculation were one-half of transactions—inflated to a gross annual basis.¹² Daily-average transactions are summarized in Table 3.

Over the 1955-65 interval, gross spread profits exhibited several distinct trends. From 1955 to 1958, they rose from \$64 million to \$98 million—or by slightly more than 50 per cent—as volume in all maturity categories increased and spreads on coupon securities widened (Table 2).¹³ During the next 3 years, 1959-61, spread profits dipped to an average of \$92 million and then jumped to \$106 million in 1962. Both movements stemmed largely from fluctuations in sales of 5- to 10-year maturities. After 1962, spread profits turned down for two reasons: the narrowing spreads on 5- to 10-year securities (and on 1- to 5-year issues in 1963) and the declines in sales in all maturities of coupon issues after

⁹ It is possible that shifts in customer trading patterns may have led to a net reduction in average spreads per unit of observed volume, when all other factors were held constant. In particular, professional (interdealer) trading is known to be conducted "close-up," that is, at minimal spreads. However, transactions with dealers and brokers in U.S. Government securities have not increased relatively over the past 6 years. (In terms of all maturity categories, transactions among dealers and brokers as a percentage of total dealer transactions averaged about 30 per cent in each year, 1961-65 inclusive.) Hence, lacking more detailed figures on maturity categories, it does not appear that shifts in trading patterns by type of customer have been a factor leading to narrower average spreads.

¹⁰ Spread profits for Federal agency securities were not computed annually owing to the absence of specific spread quotations. A rough estimate of such profits in 1965 would be on the order of \$10 million to \$15 million.

¹¹ These computations are biased upward, perhaps by as much as 50 per cent in coupon categories. The bias stems from the difference between quoted and actual spreads and the narrower spreads on interdealer transactions. As quoted spreads widen, the possibility of a gap between quoted and actual spreads increases; thus, this bias may have become more pronounced in the 1960's.

¹² Sales figures alone were not available for the entire 11-year period. In reality, sales exceed one-half of total transactions because allotments are not included with purchases. Allotments in auctions and underwritings during 1960-65 amounted to an estimated 5 to 10 per cent of reported sales.

¹³ The year-to-year volatility in estimated spread profits observed in Chart 3 for individual maturity categories of coupon issues is a function primarily of sales, which in turn may be strongly influenced by variations in the volume of new issues offered by the Treasury. The passage of particular issues from one maturity category to another may also account for some of the annual fluctuations.

1963. From 1963 to 1965, total sales of coupon issues fell 20 per cent.

The decline in spread profits after 1962 clearly depressed dealer income in 1964 and 1965. At the same time, one can hardly conclude from the foregoing analysis that gross spread profits contributed significantly to the reduced level of net income in 1961-65 relative to the preceding 5 years. Not only did spread profits reach a peak in 1962, but also the average level of spread profits for 1961-65 was \$4 million, or nearly 5 per cent, above the earlier 5-year period.

Furthermore, spread profits on Federal agency securities were undoubtedly higher in the later period owing to expanded sales. Dealer sales of agency securities generally paralleled the trend in issues outstanding, which grew from \$2.9 billion in 1955 to \$7.9 billion in 1960 and \$13.8 billion in 1965. Dealer sales of agency securities doubled in the 1960-65 period alone. Although narrower spreads did offset much of the 150 per cent expansion in bill volume from 1955 to 1965, spread profits on bills were a minor component of the total. Had spreads been the same in 1965 as in 1960 (the peak year for net income), spread profits on bills would have been increased by only \$7 million, a small increment in total spread profits.

Future growth in spread profits will depend, of course, on the trends in spreads and in sales of U.S. Government securities. Increased competition from other money market instruments and from additional dealers is likely to remain. On the other hand, rate volatility, which has been somewhat greater since late 1965, is difficult to predict. The stability so evident in rates in the early 1960's was based on a peculiar combination of public and private factors, any or all of which may change considerably.

Sales volume is a function primarily of the level and maturity composition of outstanding marketable debt.¹⁴ Since the turnover of securities (dealers sales/debt outstanding) diminishes as the time to maturity lengthens, sales

growth is contingent not only on fiscal policy but also on debt management policy. A \$1 billion rise in Treasury bills outstanding during the 1955-65 period led to a \$20 million rise in daily-average transactions in bills, whereas a \$1 billion rise in coupon securities stimulated an expansion of only \$3 million to \$4 million in trading in coupon issues.

Nevertheless, before concluding that growth in the volume of short-term issues outstanding will benefit dealers more than a similar growth in coupon issues, differences in the profitability of sales in various maturity classes must be considered, along with the effect of debt increases in each class on spreads themselves. In 1962, for example, a sharp increase in outstanding 5- to 10-year issues initially resulted in enhanced spread profits. Subsequently, however, this expansion is believed to have led to narrower spreads due to the greater availability or liquidity of these securities.

Sales volume, particularly in longer-term securities, also varies inversely with the degree of monetary tightness. In the early 1960's, coupon sales turned down in all maturity categories except issues with maturities of over 20 years;¹⁵ from 1963 to 1965, when interest rates were rising, total sales of coupon issues declined almost 20 per cent. In late 1966 and early 1967, when interest rates turned down, sales of such issues expanded appreciably above the average level of the preceding 2½ years.

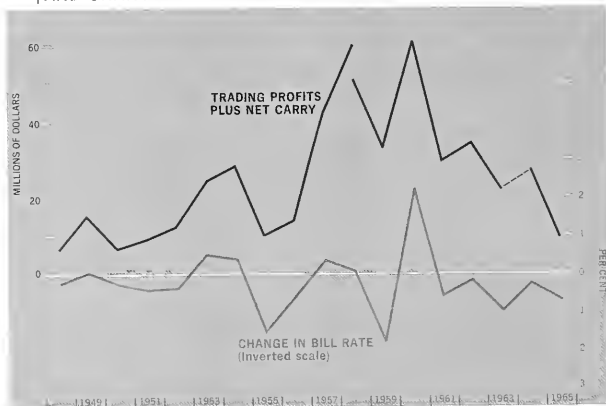
Price (rate) changes; positions. The second and by far more volatile component of trading profits is the gain or loss associated with price changes of securities held in position. These changes are a function of economic activity and monetary policy and are accepted as part of the dealers' environment. Trading profits vary directly with price changes and depend on the size and rapidity of such changes, the size and composition of dealer positions, and the success of dealers in anticipating price movements.

The close relationship between rate changes

¹⁴ See Ahearn-Peskin, Part 2 of this series.

¹⁵ Sales of Federal agency securities rose in every year from 1960 to 1965.

4 | TRADING PROFITS PLUS NET CARRY, AND CHANGE IN TREASURY BILL RATE, 1948-65



NOTE.—For description of trading profits plus net carry, see Table 1. Level of Treasury bill rate is average of daily figures for week containing December 31 and is plotted as of midyear for comparison with other series.

and dealer revenues is apparent in Chart 4, which presents annual *changes* in the 3-month bill rate (plotted inversely) and the annual level of trading profits plus carry. In years when movements in the bill rate reversed direction—as indicated in the chart by a movement from plus to minus or vice versa—the level of gross profits changed in accordance with the rate movements as plotted. For all other years (except 1958), when the bill rate continued to change in the same direction as in the prior year (as for example in 1954), the “wrong” movement in gross profits can be attributed largely to a rebound effect, since capital gains and losses were not cumulative from year to year and the magnitude of the rate change was usually diminished. Of course, the size and direction of movements in long-term rates in some years modified the observed rate/profits relationship. In 1962 the rise in gross profits undoubtedly derived in part from falling long-term rates over the year.

The size and the composition of dealer positions determine the impact of a given price change on trading profits. Large positions, particularly in long-term coupon securities, will naturally affect profits more than small posi-

tions. The net contribution to profits of capital gains or losses on positions depends on the success of dealers in anticipating the direction and extent of price movements and in adjusting positions appropriately. As the professionals in the market, and in fact the mechanism for effecting price changes, dealers may be expected to do better than break even in the ebb and flow of prices.

The year 1958 offers a clear example of how dealers were able to profit by making timely adjustments in their positions during a sharp intrayear change in securities prices. In that year trading profits soared despite a sharp rise in bond rates and a very small net decline in bill rates. Table 4 presents average daily positions for all dealers in each quarter of 1958 along with changes in bill and long-term bond rates; it also shows trading profits plus carry for all nonbank dealers. In the first half of the year, nonbank dealers had trading profits plus carry of \$36.1 million, compared with \$6.4 million in the second half. With estimated operating expenses of about \$17 million for the year as a whole, it is apparent that nonbank dealers as a group suffered net losses in the third and fourth quarters. Yet, they were

able to post the second highest annual net income in the entire 1948–65 period.

The emergence of an apparently new pattern of economic expansion—one that is much longer than the pattern of the 1950's and that is followed by short, sharp retrenchments in interest rates—has altered the flow of profits to dealers. The implied effect on earnings is still indeterminate. Less frequent cycles, *prima facie*, would tend to indicate a drop in long-term profitability and at the same time magnify the importance of catching the peaks and troughs in rate movements. Greater control of economic growth should also imply decreased amplitude in rate movements; this in turn, despite the ability of dealers to adjust relative positions correctly at alternate stages of the business cycle, would mean diminished earning opportunities.¹⁶ Potentially offsetting these factors is the extent to which dealers expand and contract positions, particularly in the longer-maturity categories, and the timing of these changes.

TABLE 4: NET POSITIONS IN U.S. GOVERNMENT SECURITIES, RATE CHANGES, AND TRADING PROFITS PLUS NET CARRY, QUARTERLY 1958

Quarter	Average net positions (all dealers)		Rate changes		Nonbank dealer trading profits plus carry
	All maturities	Coupon securities	3-month bills	Long-term bonds	
	In millions of dollars		Percentage points		In thousands of dollars
I.....	1,932.0	1,063.6	—1.69	— .03	21,078
II.....	2,198.3	1,248.5	— .29	.07	15,016
III.....	1,017.9	397.9	1.91	.57	2,202
IV.....	839.5	373.4	— .03	.00	4,165

NOTE:—Position data, from Appendix Table 4 of the Ahearn-Peskin study cited in Table 2, are averages of daily figures; rate changes are based on daily-average rates for the first and last week of each quarter; trading profit plus net carry data, from Benston.

Obviously, the timing of position changes in relation to weekly or monthly rate fluctuations—that is, intracyclical position levels—can also lead to net capital gains or losses (with

no net change in rates). Over the 1955–65 period, Ahearn–Peskin found a significant correlation between a quarterly change in positions and the preceding quarter's change in prices. This suggests that dealers passively benefited when prices happened to be rising and lost when prices were falling. An examination by Studness indicated that dealers made correct position adjustments prior to price changes in the late 1950's but after such changes in the early 1960's.¹⁷ These results would certainly imply less favorable profit performance in the later period and raise the question of why expectational expertise apparently deteriorated.

NET CARRY

The magnitude of net carry—and its variation over time—is a function of (1) the structure of interest rates, (2) the size and composition of dealer positions, (3) financing sources, and (4) the variety and substitutability of instruments competing with U.S. Government securities. The contribution of net carry to earnings throughout the period of discussion is impossible to measure accurately, owing primarily to the aforementioned inability of many dealers to segregate discount earned (interest) from trading profits on Treasury bills.¹⁸ Despite these shortcomings, it is useful to examine the behavior over the past decade of those factors mentioned above.

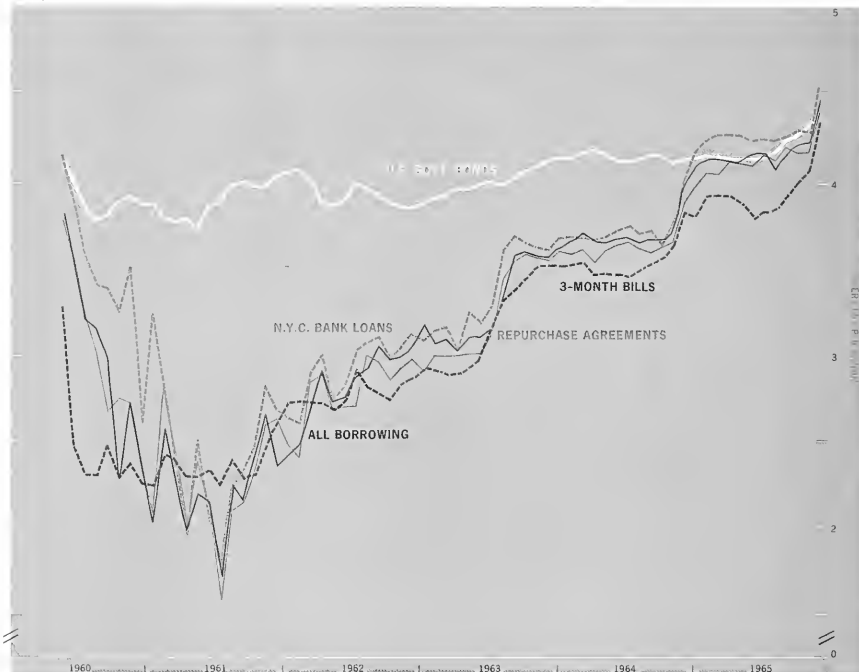
Since loans to dealers compete with other money market instruments as a source of short-term investment, the cost of such loans

¹⁷ Charles Studness, "Dealer Activity in the Government Securities Market: Determinants of Dealer Transactions and Positions, 1955–66" (unpublished draft prepared for Joint Treasury–Federal Reserve Study of the U.S. Government Securities Market).

¹⁸ In the Meltzer–von der Linde data, dealers apparently included all bill income in interest earned. In the Benston data for 1958–63, several dealers placed bill income with trading profits whereas others combined it with interest earned; for those years, therefore, it was not feasible to record a series on net carry. In the Market Statistics data, all bill income is incorporated with interest earned. In none of these series did dealers include in interest earned the price appreciation on coupon securities purchased at a discount that represented interest accrual, or make the opposite adjustment for premium prices.

¹⁶ The idea of a reduced amplitude in rate swings would seem thus far to have been discredited by rate behavior in the summer and fall of 1966. It is indeed apparent that future fluctuations will depend on the relative emphasis on monetary versus fiscal policy as well as on the types of expectations generated by these policies.

5 YIELDS ON U.S. GOVERNMENT SECURITIES COMPARED WITH DEALER BORROWING COSTS, 1960-65



NOTE.—Borrowing rates were selected from special reports submitted by several nonbank dealers and are believed to be representative of all borrowing costs of nonbank dealers. Rates on repurchase agreements represent the cost of short-term borrowing from sources other than New York City banks. "All borrowing" is the over-all cost of financing reported by

one dealer; over-all financing costs of other dealers may vary slightly, depending on the particular mix of borrowing from New York City banks and other sources. Treasury bill rates are monthly averages of daily rates on the outstanding bill closest to a 3-month maturity; rate on U.S. Government long-term bonds, from Federal Reserve *Bulletin*.

should be closely associated with rates on these substitutes. Indeed, bank dealers have typically applied the Federal funds or the 3-month bill rate in computing the cost of internal funds used. Nonbank dealers, for their part, have also financed securities at interest costs approximate to these money market rates, as shown in Chart 5. Interest costs for different types of dealer financing, as reported by selected dealers, are shown along with the 3-month bill rate and the rate on long-term U.S. Government bonds.

In the absence of actual data on net carry, the difference between the 3-month bill rate

and longer-term bond rates should provide a suitable proxy for tracing relative carry profitability over time. Such differences are plotted in Chart 6. In general, the carry differential widened during recessions (1958, and 1960–61) when interest rate levels were low, and narrowed as rates rose.¹⁹ (During boom periods the 3- to 5-year rate had a tendency to rise above the long-term rate, making intermediate-term issues relatively less costly to position.) Thus, it is evident that the behavior of net carry over the past decade has usually

¹⁹ Most of the fluctuation in the differentials reflected changes in rates on 3-month bills.

compounded the impact of changing prices on profits.²⁰ In 1961, when prices of securities declined, it is estimated that a large part of net income—perhaps \$3 million out of total net income of \$6 million—represented profits on carry. In most other boom years, however, such as 1956, 1957, and 1965, it is likely that negative carry profits aggravated already diminished levels of trading profits and net income.

The potential for profitable carry declined steadily from 1961 to 1965 as the Treasury and the Federal Reserve worked jointly to increase the relative supply of bills, in an attempt to induce higher yields, and to decrease the relative supply of longer-term securities, with an attendant lowering of yields. However, it should be noted that in previous periods of

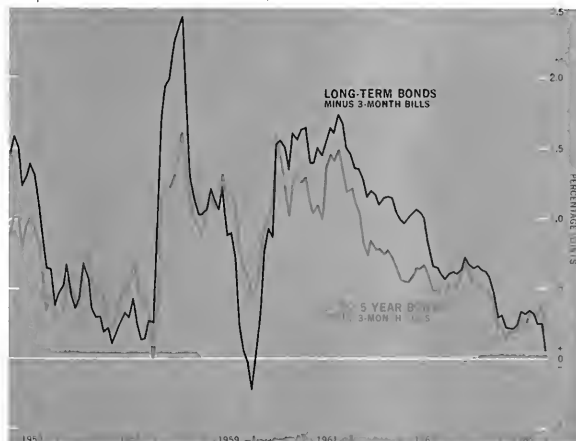
economic expansion the yield curve had flattened. On the assumption that a similar pattern occurred in this period, it is impossible to assess accurately the relative impact of changes in supplies of bills versus longer-term issues.

Whether position size and composition help or hinder earnings depends on whether financing costs are higher or lower than security yields. Although there may have been some tendency for positions in different maturities to vary with the sign of the cost-yield differential, Ahearn-Peskin found neither strong nor consistent relationships of the type to be expected. It is probable that the inventory motive and expectations about prices largely outweighed considerations with regard to carry. The fact that significant relationships were found between short positions and carry suggests that dealers may have preferred to use short sales to meet customer needs rather than to hold securities with negative carry.²¹

²⁰ In 1961, when the difference between short- and long-term rates was quite large, net profits from carry were estimated to have been about \$3 million. This estimate was based on average annual interest rates and on net dealer positions for several maturity categories of securities, with the assumption that carrying costs were equal to the 6-month bill rate.

²¹ This observed relationship may be spurious, however, since short sales may be more directly related to the behavior of interest rates.

6 ESTIMATES OF CARRY PROFITS ON SELECTED MATURITIES OF U.S. GOVERNMENT BONDS, 1955-65



NOTE.—Rates on U.S. Government securities are monthly averages of daily figures, from Federal Reserve Bulletin. The 3-month bill rate is used as a proxy for the rate charged for financing dealers' positions.

Dealer profits (or losses) from carry also depend on the type and source of borrowed funds. Referring again to Chart 5, the cost of repurchase agreements, such as those made with corporations, was noticeably lower than the rate paid for bank loans. Among bank loans, rates charged by "out-of-town" banks during most of the late 1950's were $\frac{1}{2}$ point or more below those of New York City banks. These differentials, however, narrowed substantially during the early 1960's; much of the shrinkage has been attributed to the broader use of competing instruments, notably Federal funds and CD's. Greater mobility of bank reserves has meant that rates on out-of-town bank funds have become more sensitive to, and thus have moved closer to, rates prevailing at New York banks. Likewise, the development of CD's, which can be tailored to meet specific corporate needs and which have rates slightly above those on short-term bills, has virtually eliminated the advantageous position that had been held by dealer repurchase agreements as an outlet for short-term funds.

TRENDS IN TRADING PROFITS PLUS CARRY, BY TYPE AND SIZE OF DEALER

In order to evaluate differences in performance among dealers, figures for trading profits plus carry were deflated by gross annual sales for three dealer groups in each of the years 1958-65. The results for five bank dealers,

five large nonbank dealers, and five small nonbank dealers are shown in Table 5.

From 1958 to 1963, the operations of the large nonbank dealers were generally the most profitable of the three groups, and this group had the greatest consistency in performance. Not until 1965 did a large dealer incur a loss in its Government securities operations. Small nonbank dealers, nevertheless, were not far behind in 1960-61, and in 1962, 1964, and 1965 their gross earnings per unit exceeded those of the larger nonbank dealers. From an examination of individual dealer performance, it appears that since 1960 small dealers have been as profitable per unit of sales as large firms, if not more so, but that at the same time small dealers have been more vulnerable to changing conditions. One important source of the enhanced profitability has presumably been the increasing proportion of Federal agency activity in total transactions of the smaller firms.

Per-unit gross earnings of bank dealers lagged behind those of nonbank dealers in every year. This result, and differences between the large and small nonbank dealers, does not necessarily imply varying levels of efficiency or expertise. Bank dealers, rather, have concentrated their activity in the bill market, where profits per unit of sales are lowest. However, because bill positions require correspondingly less capital than coupon positions, it is impossible to determine which

TABLE 5: TRADING PROFITS PLUS CARRY PER MILLION DOLLARS OF SALES, 1958-65, BY DEALER GROUPS

In dollars

Dealer group	1958	1959	1960	1961	1962	1963	1964	1965
Five bank dealers:¹								
Weighted average	149	95	212	104	103	88	...	32
Unweighted average	154	139	251	119	118	94	...	34
Range: High	525	320	505	261	271	160	...	66
Low	-109	-81	20	36	55	23	...	3
Five large nonbank dealers:								
Weighted average	400	234	418	181	183	111	125	45
Unweighted average	380	237	419	182	183	116	130	56
Range: High	508	314	567	204	216	168	163	121
Low	279	117	285	162	148	20	91	-57
Five small nonbank dealers:								
Weighted average	213	119	404	148	198	52	160	109
Unweighted average	184	58	377	157	205	26	193	133
Range: High	421	176	667	270	304	133	455	429
Low	-224	-219	96	85	111	-113	101	-97

¹ Interest expense based on the average rate on Federal funds.

TABLE 6: RATIOS OF SELECTED INCOME AND EXPENSE ITEMS TO GROSS SALES, BY DEALER GROUPS, 1964-65

In dollars per million dollars of gross sales

Income or expense item	1964	1965	
	Nonbank	Bank	Nonbank
Trading profit—			
On Treasury bills: ¹			
Unweighted average.....	40	27	17
Median.....	37	30	17
Weighted average.....	...	...	...
On other securities: ²			
Unweighted average.....	253	-26	88
Median.....	271	99	77
Weighted average.....	252	109	121
Operating expenses:			
Unweighted average.....	122	86	126
Median.....	91	66	96
Weighted average.....	97	77	96

¹ Figures based on reports for five nonbank and four bank dealers.² Includes profits on Government coupon issues, Federal agency securities, and CD's, and also profits on Treasury bills by bank and nonbank dealers not reporting these figures separately.

group registered the higher return on capital—bank or nonbank dealers.

In 1964 and 1965, all nonbank dealers reported separate figures for trading profits (ex carry) on coupon issues, and five of the group reported such data for bills. Bank dealers reported coupon profits in 1965, with four of them also reporting trading profits on bills. These data, per unit of sales, are presented in Table 6.

The pattern is much as anticipated: Per-unit profits are substantially higher for coupon issues than for bills, and trading profits (*not* including carry) declined from 1964 to 1965 for both bills and coupons in line with falling prices. What is perhaps surprising is that bill profits were higher for banks than for nonbank dealers in 1965. Nonbank dealers have claimed from time to time that banks are willing to trade bills less profitably because of the derivative correspondent benefits, but pending the availability of additional dealer data, this claim cannot be substantiated. It is possible that variations in computation methods have led to this observed difference.

OPERATING EXPENSES

Aggregate operating expenses of dealers maintained a fairly stable but definitely rising trend throughout the 1950's and the early 1960's

(Chart 1). Growth in such expenses, however, was paralleled by an expansion in Government securities transactions, with the result that dealer expenses per million dollars of sales appear to have declined slightly over the past decade, as shown in Table 7.²²

The deflation of dealer expenses by sales substantially eliminates variations in costs stemming from sales volume; what remains are changes in per-unit variable and fixed costs. Clearing charges constitute the principal element of variable costs. Typically, these charges range from \$5 to \$10 per million dollars of bills traded to \$10 to \$35 per million dollars of coupon securities.²³ The higher costs for clearing coupon securities result from the extra handling involved in checking coupons and the smaller typical size of transaction.²⁴ Unfortunately, there are no data on the trend in per-unit clearing charges over the past 10 years, primarily because such charges are negotiated between clearing agents and individual customers and because they depend largely on the volume or profitability of each customer's business. The consensus of several dealers, however, is that such charges have not changed to any noticeable degree.

Although the fixed expenses associated with Government securities operations have undoubtedly risen since 1955, the rapid expansion of dealer sales appears to have offset these increased costs on a per-unit basis, as suggested in Table 7. However, this conclusion

²² As noted in the introduction, neither definitions of items nor reporting procedures are known for the Meltzer-von der Linde and Benston series. Because no expense itemization was requested in 1964 and because of obvious discrepancies in and among dealer reports to the Market Statistics Division in 1965, a breakdown of expenses has not been attempted for these 2 years. As a result of the experience with regard to the figures for 1965, little weight should be attached to the absolute figures in the two earlier studies.

²³ Clearing charges are proportional to dollar value and are assessed only on sales. Bank dealers do their own clearing but virtually all nonbank dealers clear through a bank. Most bank dealers, nevertheless, allocate a portion of general clearing expenses to their Government securities operations.

²⁴ The latter determinant suggests that there is, in fact, a fixed *plus* a variable charge for clearing.

may be misleading. In the first place, growth in transactions has been mainly in Treasury bills—entirely so since 1960—where gross spread profits are lowest. In this sense, per-unit fixed expenses have increased as a proportion of over-all spread profits per unit of sales.

Second, a comparison of figures in Table 7 and Table 1 indicates that per-unit operating expenses are closely related to net income. In most years when profits rose—1949, 1953, 1957, 1958, and 1960—operating expenses (per unit) advanced also, paced primarily by salaries. The increases in salary expenses presumably derived from profit-oriented bonuses. Were this the case, the relatively low level of costs per unit of sales in the 1960's may have been achieved largely at the expense of bonuses. Of course, it is a matter of conjecture whether these salary and wage levels are competitively sustainable; if not, the trend in long-

term operating expenses—both in the aggregate and per unit of sales—has been understated.

The expense data of nonbank dealers for 1964 and 1965 showed virtually no year-to-year change (Table 6). Moreover, the expense variations among dealers were small in both years.²⁵ The lower (weighted) average level of unit expenses reported by bank dealers for their Government securities operations in 1965 (\$77 versus \$96 for nonbank dealers) may derive from certain operating economies inherent in sharing overhead expenses with other related bank activities.

Unit operating expenses of the five large nonbank dealers averaged \$90 and \$95 in 1964 and 1965, respectively, whereas corre-

²⁵ Data for individual dealers are not shown. In 1964 and 1965, 7 and 9 of 12 nonbank dealers, respectively, had operating expenses between \$73 and \$105 per million dollars of sales.

TABLE 7: OPERATING EXPENSES PER MILLION DOLLARS OF SALES, U.S. GOVERNMENT SECURITIES DEALERS, 1948-65¹

Source and coverage of data	Year	Salaries	Other	Total
		In dollars		
Meltzer-von der Linde ²				
All operations of nonbank dealers; and operations in U.S. Govt. and related securities of bank dealers	1948	49	40	88
	1949	60	45	105
	1950	34	37	71
	1951	44	45	89
	1952	46	48	93
	1953	50	53	104
	1954	44	51	95
	1955	46	58	104
	1956	51	61	112
	1957	61	63	123
	1958	59	63	122
Benston ³				
Operations in U.S. Govt. and related securities of bank and nonbank dealers	1958	40	60	100
	1959	40	58	97
	1960	50	68	117
	1961	43	54	96
	1962	40	56	95
	1963	37	55	92
Market Statistics Division, Federal Reserve Bank of New York				
Operations in U.S. Govt. and related securities:				
Nonbank dealers	1964	...	...	97
Bank dealers	1965	...	...	77
Nonbank dealers	1965	...	...	96

¹ Because of rounding, figures may not add to totals. Figures are weighted averages for Market Statistics data, and it is believed that the Meltzer-von der Linde and Benston data were computed in a similar manner. In all three series there were variations among dealers in the treatment of specific expenses. Items included in operating expenses by some may have been charged against trading profits or interest earned (or added to interest paid) by others. Furthermore, in the Benston and Market Statistics data there may have been considerable error on the part of some diversified dealers in the allocation of overhead expenses to the various firm functions.

² For both nonbank and bank dealers the figures have been deflated only by sales of U.S. Government securities. Data are extrapolated from complete income statements of from 7 to 13 dealers. The bank/nonbank composition of this group is not known.

³ Data are extrapolated from reports of a varying number of dealers

sponding costs for the five small nonbank dealers were \$166 and \$165.²⁶ The large differences in both years between the two groups of nonbank dealers may be explained in part by economies of diversification, as suggested for bank dealers, since on balance the large dealers were considerably more diversified. Such a finding would have important implications for dealer profitability over the long term, as would definite signs of economies of scale with respect to the volume of transactions.

Rank correlation analysis was employed to test for the latter relationship, in terms of both levels and changes (from 1964 to 1965) in transactions and unit operating expenses, but no significant relationships were found. This result casts considerable doubt on the meaningfulness of the described cost differences between large and small dealers. A large part of these differences may have in effect stemmed from the sales "denominator," wherein varying sales mixes produced dissimilar unit expenses. The two dealers with the highest unit expenses in 1965, for example, also had the highest ratios of agency transactions to total transactions and both were small dealers.

REGRESSION RESULTS

Multiple regression analysis was employed to estimate the relative importance of the contributing components in the net income equation. It should be noted that the observed relationships are in terms of realized profits, although with certain variables—particularly positions—it is the dealers' adjustments to expectations and the resultant discrepancy between expected and realized profits that should be of major concern.

Equations were estimated by using the monthly data on dealer earnings furnished for the Benston study. These data encompass the 6 years 1958–63 and thus were conveniently divisible into two subintervals, which more or less coincided with the two broad periods under investigation. The general model tested here differs basically from the equation set

forth earlier in that: (1) it deals with gross rather than net earnings before taxes, (2) profits from trading and carry are lumped together as the dependent variable, and (3) gross earnings are deflated by sales.²⁷

A gross earnings concept was substituted for net income because of the unreliability and incompleteness of monthly data on operating expenses. In view of the problems that dealers encountered in preparing the annual reports submitted to the Market Statistics Division for 1964 and 1965, it is doubtful that the dealers were able to allocate to their Government securities operations little more than clearing charges on a monthly basis. In addition, two nonbank dealers submitted no expense data at all.

The dependent variable includes both reported trading profits and net carry, since some dealers—as noted earlier—reported aggregate income from bills as trading profits whereas others included it with interest earned. Total trading profits plus carry was deflated by monthly sales of all nonbank dealers to eliminate the effects of market growth and bring out more specifically the profitability of Government securities operations. The dependent variable (X_0) is expressed as dollars of trading profits plus carry per million dollars of sales. The independent variables tested were as follows:

1. Spread
 - X_1 —Quoted bid-asked spread on 3-month bills
2. Transactions
 - X_2 —Sales, all securities, nonbank dealers
 - X_3 —Bill transactions, all dealers
 - X_4 —Coupon transactions, all dealers
3. Rates and rate changes
 - X_5 —Change in end-of-month, 3-month bill rate
 - X_6 —Change in long-term bond rate (Federal Reserve series)
 - X_7 —Change in bill rate, last 3 days of preceding month
 - X_8 —3-month bill rate

²⁶ Unweighted averages were used in this instance to lessen the bias of extreme values.

²⁷ Only nonbank dealer data were used since bank dealers submitted no figures on interest expense.

4. Positions

- X_9 —Bill positions, all dealers
- X_{10} —Coupon positions, all dealers
- X_{11} —Total positions, all dealers

5. Others

- X_{12} —Dummy variable for 1960 data revision
- X_{13} —Dummy variable for months when there were advance refundings

In all, 17 equations were estimated for each of three time periods—1958–63, 1958–April 1960, and 1961–63. The equations used the same dependent variable and many of the same independent variables. Differences in specification entailed mainly alternative transactions, positions, and rate differential or level variables, owing to substantial multicollinearity among variables. Five representative equations are presented in Appendix Table 3. In the earlier subperiod, observations were used only through April 1960 because of the discontinuity in the data created by reporting revisions in the following month.

Rate changes. Interest-rate-change variables—the proxy for realized changes in the value of positions—proved to have the greatest impact on monthly trading profits plus carry. Two such variables were employed in every equation—the month-end to month-end change in the 3-month Treasury bill rate (X_5) and the change in the monthly-average level of long-term U.S. Government bond rates (X_6), using the Federal Reserve series on Government bond yields. These two series were not highly intercorrelated and each contributed substantially to the total explained variation. Experimentation with various rate-change variables indicated that this particular pair yielded the best results.

A third rate-change variable was used concurrently, but for a slightly different purpose. Dealers, in calculating monthly income figures for the Benston series, may not have included the unrealized appreciation or depreciation on month-end positions. Such gains or losses would usually be realized in the succeeding month. On the assumption that dealers turn over their positions every few days, only those

rate changes that occur at month-end would lead to unrealized gains or losses. The change in the 3-month bill rate over the last 3 days of the preceding month (X_7) was therefore included. It proved to be highly significant for the 1958–April 1960 period and for the full 6 years 1958–63.

Several tentative observations may be drawn from the examination of the rate-change coefficients. The bond coefficient (X_6) was consistently larger than the bill coefficient (X_5), often by a factor of two or more. Changes in bond rates were undoubtedly more representative of broad changes in security yields than were variations in the bill rate, and given changes in long-term yields have a greater effect on prices. Second, the rate-change coefficients were always larger in the early 1960's than in the late 1950's. This suggests that dealers carried larger positions relative to transactions in the later period.

Spread.²⁸ The spread on Treasury bills (X_1) was positively related to gross earnings in all periods tested, although the coefficients were significant only for regressions covering the full 6 years and were much smaller than the rate-change coefficients. Despite the importance over the long run of spread profits to dealer income, there are several reasons why these two results might be expected. First, the spread on bills may not have been a valid proxy for all spreads; for example, whereas bill spreads narrowed throughout much of the

²⁸ The variable serving as a measure of spread was the bid-asked differential on the new 3-month bill, as reported by the Securities Department of the Federal Reserve Bank of New York in its "Composite Closing Quotations" for the Thursday following each new auction. Spreads on bills were typically smaller during the week of auction than in succeeding weeks. The new 91-day bill, for example, might have had a 3-basis-point spread on Thursday while the 84-day bill (issued the previous week) had a quoted 6-point spread, reflecting in part the greater dispersion and scarcity of the latter issue. The Thursday quoted spread on the new 3-month bill was considered more representative of actual spreads, more sensitive to changing competitive and risk conditions, and less a function of scarcity than bills that had been fully digested in the market. The monthly spread figure is an arithmetic average of Thursday figures.

1955-65 period, spreads on some coupon issues widened. Because of the difficulty in selecting a meaningful proxy and of the fact that trading profits for bills and for coupon issues were not segregated, a variable for the coupon spread was not introduced.

The second reason may be the lack of month-to-month variation of bill spreads, particularly in the 1961-63 period. (Quoted coupon spreads varied even less.) As a result, much of the importance of spread contributions to income may have shown up in the constant terms, which were typically similar in magnitude to the rate-change coefficients. In addition, use of monthly data—as opposed to, say, annual data—has undoubtedly led to an underestimation of spread influence relative to changes in interest rates.²⁹

Carry rates. In pilot regression runs, the spread between the Federal Reserve series on yields of long-term bonds and the 3-month bill rate was tested as a proxy for net carry. The variable coefficients were never significant and occasionally had the wrong sign. Furthermore, because of the relative stability of the bond rate, the rate-spread variable was found to be highly correlated with the 3-month bill rate itself. Hence, in the final set of regressions, the bill rate (X_5) was substituted for the rate differential, representing not only carry but general monetary conditions as well. Occasionally the results were significant, and they had the expected sign; however, the variable contributed very little to the explanatory power of the set of independent variables.

Transactions. To estimate the effect of trading volume on profitability, trading profits plus carry per unit of sales were regressed against three variables for transactions (purchases plus sales): bill transactions of all dealers, coupon transactions of all dealers, and

total sales of nonbank dealers.³⁰ With gross earnings already deflated by sales, these variables might be expected to reflect changes in bid-asked spreads not picked up by the spread variable itself.³¹ Our hypothesis was that trading volume is inversely related to spread, since higher volume enhances liquidity in the market and therefore reduces the risk element in the spread.

The coefficient for coupon transactions (X_1) was found to be positive in all three periods, significantly so for the 6-year and the initial 3-year intervals. The coefficients for total sales (X_2) and bill transactions (X_3) were found to be negative and significant in the same periods. With these mixed results, it is difficult to assess the validity of the hypothesis.

It is more likely that the observed effect stemmed from the nature of the data involved. The dependent variable incorporates profits on, and transactions in, both bills and coupon securities. Because transactions are considerably more profitable for coupon issues than for bills, the dependent variable should vary with the composition of total sales between the two types. The differential effect of composition changes on the numerator and denominator of the dependent variable, therefore, may well have produced the particular regression results at hand.

A dummy variable (X_{13}) was introduced for the 8 months in which advance refundings occurred in the 1958-63 period. The coefficient was consistently positive and significant for regressions covering the 6-year period but neither consistently positive nor significant for the 1961-63 interval in which six refundings were conducted. Inasmuch as activity in coupon issues increased substantially during months when there were refundings, higher profits per unit of total sales might be expected on the basis of the foregoing argument. The fact that the coefficients for the 1961-63 period were

²⁹ On a monthly basis, interest rates fluctuated more widely than did quoted spreads. Were annual data used, the relative magnitude of spread changes would increase while the gains and losses associated with monthly rate changes would cancel out to some degree. The annual "net" of monthly changes in trading profits plus carry would therefore be more sensitive to variations in spread.

³⁰ It was necessary to use total sales for the latter group because no breakdowns between bills and coupon issues were readily available for either transactions or sales.

³¹ Shortcomings in the spread variable are discussed under "Spread" beginning on p. 100.

not significantly different from zero suggests, assuming that the number of refunding observations was not inadequate, that spreads on coupon issues were lower during refunding months.

Positions. Dealer-position variables were inserted alternately with the bill rate (X_8) as proxies for net carry profits, on the assumption that all capital gain or loss effects associated with position levels had been removed by the rate-change variables.³² The results were mixed and generally insignificant. The bill coefficient (X_9) was negative and the coupon coefficient (X_{10}) was positive for the 6-year period, as might be expected, with a positively sloping yield curve.³³ At the same time, how-

ever, both coefficients were positive in the late 1950's (1958–April 1960) and negative in the early 1960's (1961–63). Examination of spreads between dealer loan rates at banks (New York City and out-of-town) suggests that the average excess of these over the 3-month bill rate was greater in the earlier period, implying a higher negative carry on bills at that time. In light of these results, there is a strong likelihood that coefficients in the two subintervals may have in fact been influenced by factors other than relative rates, such as capital gains and losses associated with position levels.³⁴

³² Position data were for all dealers since nonbank dealer figures alone were not readily available for 1958–60.

³³ This note appears in opposite column.

³³ Although the 3-month bill rate was used as a proxy for financing costs in the discussion of net carry, financing costs have typically exceeded that rate. See footnote 20.

³⁴ Revisions in data coverage and reporting procedures may also have affected the results.

IV. DEALER CAPITAL: CAPACITY IN THE INDUSTRY

The term "capital" used in this study refers to shareholder or partnership equity in a firm—that is, net worth. Net worth is often employed as a base for calculating profitability. It is also assumed to function as a measure of, and constraint on, a firm's ability to borrow. Unfortunately, conceptual and statistical difficulties render net worth a poor measure for assessing either profitability or the potential for borrowing by Government securities dealers.

In the case of nonbank dealers, difficulties in segregating capital used for their operations as Government securities dealers arise both because of the intermingling of activities in an operational sense and because capital often flows from one activity to another depending on the relative profitability of each at any point in time. There could be similar complications for bank dealers, but as a rule such dealers regard capital as neither a relevant constraint on the expansion of positions nor a suitable standard for assessing the profitability of the dealer function.

The only historical data available for nonbank dealer capital are those for aggregate net worth; therefore, in the subsequent analysis of trends in invested capital over the past two decades, it has been necessary to use this broad concept. At the same time, alternative concepts of capital more appropriate to the measurement of borrowing capacity and profitability have been developed to give some perspective to the analysis.

A discussion of measures of capital for nonbank dealers and of the arguments against applying such measures to bank dealers is presented in the Appendix. In brief, two concepts are developed for nonbank dealers: The first, capital available, is used to estimate the ability of nonbank dealers to expand their positions; the second, capital in use, is used to derive a meaningful rate of return on equity. Capital available is essentially the maximum amount of net worth available to cover margin requirements. The portion of net worth representing the book value of furniture or stock exchange

memberships, for example, is not eligible. Capital in use is simply that portion of net worth actually used to meet margin requirements—in effect, the excess of the purchase price of positions in U.S. Government and agency securities and CD's over the amount of funds borrowed.

The primary defect in using total net worth to gauge industry size is that there is no way to detect secular shifts among competing functions of the firm. Insofar as shifts of that type represent permanent or semi-permanent commitments that could inhibit flexibility, the trends in capacity growth will be misstated. On the other hand, the available net worth data may be a reasonably accurate measure of capital available in certain circumstances. For example, for nonbank dealers active prior to 1960, the dealer function constituted an important—if not the most important—part of the firm's activities. Thus observed trends in net worth should validly reflect the amount of capital available to U.S. Government securities dealers for their operations.

INVESTED CAPITAL

The expansion of assets through borrowing is a function of the amount of capital available and of the nature of the assets that may serve as financing collateral. Dealers in Government securities represent an extreme in the utilization of borrowed funds or leverage, for they typically maintain a capital/asset ratio of less than 5 per cent. Their ability to operate with this exaggerated leverage is based, of course, on the liquidity and risk characteristics of their collateral assets, namely U.S. Government securities. Expansion is limited, however, since nonbank dealers are required to provide some margin to the lender as protection against potential price declines on securities used as collateral.³⁵ These capital—or margin—re-

quirements vary according to type and maturity of collateral; margins on longer-term securities are higher because of the greater price risk incurred by the lender. In sum, the expandability of dealer positions depends on the amount of capital available for margins; on the size of required margins; and in conjunction with the latter, on the maturity composition—and types—of securities held by dealers.

Sources of change. Changes in the level of capital of nonbank dealer firms over the past two decades have resulted from varying profit performance, the entry and exit of firms, and decisions about the retention or disbursement of earnings. Marginal factors include the addition or withdrawal of capital by individual officers or partners, the issuance of long-term debt, and unrealized appreciation or depreciation. Table 8 shows the year-end level of aggregate net worth of nonbank dealers for 1948–65, based on two overlapping series.

The first series, 1948–58, was compiled by Meltzer and von der Linde largely on the basis of annual financial statements; it includes what appears to be net worth plus recognizable reserves. The second series, 1955–65, was compiled by the author from both financial statements and supplementary data available on a confidential basis to the Credit Department of the Federal Reserve Bank of New York. Much of the discrepancy between the two series in the 1955–58 period stems from the inclusion

TABLE 8: TOTAL NET WORTH OF NONBANK DEALERS IN U.S. GOVERNMENT SECURITIES, 1948–65

In millions of dollars

Year	Meltzer- von der Linde data	FRB of New York data	Year	Meltzer- von der Linde data	FRB of New York data
1948.....	54.6	...	1957.....	67.3	74.1
1949.....	58.1	...	1958.....	73.8	84.4
1950.....	53.1	...	1959.....	...	88.7
1951.....	51.9	...	1960.....	...	95.7
1952.....	53.8	...	1961.....	...	110.4
1953.....	59.2	...	1962.....	...	137.0
1954.....	64.2	...	1963.....	...	127.6
1955.....	69.3	72.1	1964.....	...	237.3
1956.....	61.4	67.2	1965.....	...	260.9

NOTE.—For differences in coverage of the data from these two sources, see text above.

³⁵ Collateral securities are necessary for long positions or short positions. For short positions the margin provides protection against price increases in the loaned securities. Bank dealers also have expansion constraints, but these constraints are not of the same nature. See Appendix.

of more permanent-type reserves in the second series. Some of the variation may also result from differences in treatment of unrealized gains or losses.

The figures on net worth generated by Meltzer and von der Linde cover the 12 nonbank dealers "designated for handling transactions in U.S. securities (with the System Open Market Account)" in 1958. In the 1948-52 period, however, only 5 of these dealers were actually so designated, whereas more than 12 were trading with the Federal Reserve at one time or another in 1953-58; thus, net worth for the group, as we have defined it, was overstated in the Meltzer-von der Linde series for 1948-52 and perhaps slightly understated for 1953-58. The discrepancy would probably be on the order of 10 per cent or less, however. For the two periods examined more thoroughly, 1955-60 and 1960-65, the net worth figures (from the Federal Reserve Bank of New York) are those for all authorized nonbank dealers.

Change, 1948-55. For the period 1948-52,³⁶ there were 10 recognized dealers—5 nonbank firms and 5 dealer departments of commercial banks. The five nonbank dealers had an estimated net worth of \$45 million at the end of 1952, and in each of these firms a considerable portion of activity was devoted to operations in Government securities. Based on their participations in sales and on their positions at that time, the five bank dealers probably "contributed" an additional \$10 million to \$15 million of capital.³⁷

In 1953 capital and other requirements for trading with the System Open Market Account were eased, and nine additional nonbank dealers received such authorization. These firms added an estimated \$10 million of capital. Although three of them, each with net worth of less than \$500,000, ceased operations within 3 years, the other six remained in the industry.

³⁶ The end of the calendar year is used as the reference for inclusion or exclusion of authorized firms.

³⁷ This and subsequent estimates of capital of bank dealers are in effect capital available—approximately the amount that would have been necessary to conduct the operation on an independent basis.

One bank dealer that began trading with the System Open Market Account in 1954 ceased at the end of 1955. With the addition of a small nonbank dealer in mid-1955, the industry at year-end consisted of 5 bank and 12 nonbank dealers with aggregate capital of perhaps \$85 million to \$90 million, including an estimated \$15 million to \$18 million for bank dealers.

Change, 1955-60. From 1955 to 1960, the membership of authorized firms remained unchanged. Total net worth of nonbank dealers rose from \$72 million to almost \$96 million, a gain of 33 per cent. During the period about \$1.3 million of new capital was invested in dealer firms and perhaps \$6 million or \$7 million was withdrawn; the bulk of the withdrawals occurred because of the death or retirement of participating partners and officers. With a decline of about \$2 million in long-term debt—from \$3.3 million to \$1.4 million—it is apparent that between \$25 million and \$30 million of earnings were retained in the industry.

Dividend or disbursement policies clearly differed among nonbank dealers. First Boston Corporation earned \$20 million in 1955-60 and paid out 88 per cent of this amount in dividends. Similarly, Discount Corporation paid out 80 per cent of its \$6.4 million of net profits. Largely as a result of this policy, the net worth of these two firms grew only 7 and 8 per cent, respectively. Other firms, however, expanded their net worth considerably, six by 50 per cent or more. It is perhaps significant that First Boston and Discount are the only publicly owned firms.

Only four firms had long-term debt outstanding during the period, and all of them were medium-sized or small. At three of these firms, such debt declined between 1955 and 1960, leaving a total of only \$1.4 million for the industry in the latter year.

Change, 1960-65. Between 1960 and 1965, the dealer industry experienced several membership changes. Three bank and two nonbank dealers joined the industry, one nonbank dealer merged with a large brokerage firm, and two nonbank dealers withdrew. Both

withdrawals from the industry were for reasons unrelated to firm performance in the Government securities market. By 1965, the number of bank dealers had risen from 5 to 8, and there were still 12 nonbank dealers.

Total net worth of all recognized nonbank dealers jumped from \$96 million in 1960 to \$261 million in 1965. Of the net increase of \$165 million, \$148 million represented the entry of two dealers plus the merging brokerage firm, \$25 million came from the increase in net worth of these three firms over the 5 years, and \$12 million represented capital accumulation at the nine previously existing firms. Partially offsetting this rise was a drop of \$20 million in net worth because of the two departures and the withdrawal of some capital from the merged dealer.

For the nine previously active dealers alone, net worth advanced \$11.9 million to \$83.6 million from 1960 to 1965, an increase of 16.6 per cent. This growth compares with a rise of \$17.5 million—32 per cent—during the earlier period. Three of the nine firms experienced a decline in net worth from 1960 to 1965, however, and \$10.4 million of the \$11.9 million increase was concentrated at two dealers.

Capital could presumably have grown faster had dealers retained a greater share of income earned. At the same time, fragmentary evidence suggests that in the 1960's the proportion of the total earnings of nonbank dealers accruing from operations in Government securities was substantially smaller than in earlier years. For 1964 and 1965 combined, for example, the Government securities operations of these dealers resulted in a net loss of \$6.8 million whereas aggregate income before taxes from all sources amounted to \$128 million (\$100 million of which was earned by one large brokerage house). It is thus possible that capital available could have declined during the period; at the very least, earnings performance provided little incentive for dealers to expand the capital used in Government securities operations.

As previously noted, five banks were pri-

mary dealers from 1955 to 1960; between 1961 and 1965, three additional banks became primary dealers and were authorized to trade with the System Open Market Account. When gross transactions are used as a measure of size, they show that the five older bank dealers grew approximately 23 per cent from 1955 to 1960 and 34 per cent from 1960 to 1965. Since most of this growth in transactions was in the bill sector where margin requirements are minimal, the rate of capital expansion could easily have been less than the growth in transactions; thus, bank dealer capital available, which was estimated at \$15 million to \$18 million in 1955, may not have exceeded \$20 million in 1960 and, for the same previously existing five bank dealers, \$25 million to \$27 million in 1965. In 1965, the three new bank dealers accounted for 27 per cent of total transactions by bank dealers, a figure that would imply an additional \$8 million of employed capital. Such a figure added to the estimate for the five dealers indicates that bank dealers had a capital investment of \$33 million to \$35 million, a figure that is close to the \$35 million estimated by the banks themselves in 1965 as necessary for their operations.

In summary, the total net worth of the active nonbank dealers plus the assumed capital investment of the bank dealers rose from a range of \$85 million to \$90 million in 1955 to about \$115 million in 1960. Based on figures of capital available for the entering nonbank dealers, the 1965 figure for capital funds employed in Government securities operations by bank and nonbank dealers was about \$140 million. This represents an approximate increase of 60 per cent over the decade. For perspective, over the same interval net positions and gross transactions for all dealers—after some adjustment for reporting revisions—are estimated to have expanded on the order of 67 per cent and 100 per cent, respectively. The two increases stemmed largely from changes in Treasury bills.

Capital growth in the industry in 1955–60 came about almost entirely through the retention of earnings. After that, the major share—

perhaps two-thirds—of new capital devolved from new entrants, as growth in the older firms slowed because of declining earnings. Whereas net worth appears to have risen in line with expanding market activity, as measured by positions and transactions, it is not so certain that capital available has expanded at a comparable pace, particularly during 1960–65.

MARGINS REQUIRED

The adequacy of dealer capital depends on the relationship between available capital and required capital. The latter is a function of the size and composition of dealer positions as well as the margins required per dollar of securities held. How large can positions grow before margin requirements exhaust the available capital, assuming a desire on the part of dealers to expand inventories to that point?

The assumption of dealers' desire to expand positions is crucial. As evidenced by the strong, positive relationship between the size of an individual dealer's capital and his position, capital available operates as a broad constraint

on position levels. However, the level of positions held at any particular time is a function of expected profits as determined by transaction volume, spreads, expected price changes, and other factors. Unless expected returns are high and/or risks low, dealers may not be induced to expand positions to what might be considered, on other criteria, the most efficient level. In this investigation we are limited to an estimate of the degree to which positions could be expanded, given favorable conditions, before encountering the absolute capital constraint. As noted in the Appendix, this exercise is valid for nonbank dealers, but a different set of criteria must be developed for judging the expandability of positions of bank dealers.

Margin rates. The most striking feature about quoted margin rates for Government securities dealers is the diversity of quotations for each of the various maturity categories, together with the apparent flexibility in applying such quotations. Schedules of approximate rates, as reported in earlier studies and by dealers and by two clearing banks in 1966, are presented in Table 9. The rates are ap-

TABLE 9: MARGINS REQUIRED ON COLLATERAL LOANS AND REPURCHASE AGREEMENTS

In basis points unless otherwise noted

Type of security used as collateral	Data from—			Other sources of data ²					
	New York Clearing House Assn.	Statement of Girard Spencer ¹	Meltzer-von der Linde	A	B	C	D		E
	1957	1958	1959	1966	1966	1966	1966		1966
							Long position	Short position	
Collateral loans:									
Treasury bills.....	0	Discount accrual	$\frac{1}{2}\%$	0-1	0	0	0-1	1	0
Certificates of deposit.....	...	...	...	0	0	0	...	...	0
Certificates of indebtedness.....	1	...	$\frac{1}{2}\%$	...	...	...	...	...	...
Notes and bonds.....	...	Accrued interest	...	(<18 mo.) 1	0	0	1	1	0
Within 1 year.....	...	2	1	(>18 mo.) 2	1-2	(<3 yr.) $\frac{1}{2}$	2	2	2
1 to 5 years.....	1	...	...	...	...	...	3	...	3
After 5 years.....	2	2	2	...	2	(>3 yr.) 1	...	2	...
5 to 10 years.....	2	...	3	3	3	...	...	3	...
After 10 years.....	3	...	...	...	...	...	...	...	...
Federal agency:	...	...	...	2-3	Same as U.S. Govts.	Same as U.S. Govts.	Same as U.S. Govts.	(?)	0
Within 1 year.....	...	...	...	2-3	U.S. Govts.	U.S. Govts.	U.S. Govts.	...	2-5
After 1 year.....	...	...	5	2-3	U.S. Govts.	U.S. Govts.	U.S. Govts.	...	2-5
Repurchase agreements:									
Within 1 year.....	...	...	...	(3 mo.) \$25/mil. (6 mo.) \$50/mil.	0	0	...	...	0

¹ Mr. Girard L. Spencer, Partner, Salomon Bros. & Hutzler, New York. (See U.S. Congress, Joint Economic Committee, *Employment, Growth, and Price Levels, Hearings*, Part 6B: "The Government's Management of its Monetary, Fiscal, and Debt Operations," 86th Cong., 1st Sess., 1959, pp. 1558 and 1559.)

² These sources prefer not to be disclosed publicly.

³ As a general rule Federal agency securities have not been used as collateral for borrowing securities.

proximate because in many instances individuals were quite vague about minimum requirements. The consensus of persons interviewed was that margin requirements had, if anything, narrowed over the past decade. Several noted that current requirements were, in practice, below the "official" margins set a number of years ago. In this connection it should be noted that there is some tendency for margins to narrow or to be less strictly enforced during periods of relatively stable rates, as in the early 1960's.

The maturity of the collateral (U.S. Government securities) was the overriding factor in the determination of margins required, and despite variations among lenders, advertised margins seemed to be granted to all Government securities dealers without discrimination. At the same time, discussions with dealers and clearing banks indicated that preferential treatment—in the form of waiving minimum requirements—was extended by some lenders on the basis of business received or of the size of the borrower in terms of capital. Size was a factor in that lenders were typically more careful in checking, on a day-to-day basis, the adequacy of margins provided by small dealers. Large dealers might be undermargined one day, and simply be asked to provide more coverage the next. Nevertheless, it is doubtful that large dealers were able to operate on continuously narrower margins than small dealers over any extended period of time.

In order to estimate minimum total capital requirements for past position levels, it is necessary to assign margin rates to each maturity category or type of position activity. Margin rates for Treasury bills, CD's, and other securities maturing in 1 year or less ranged from zero to as much as 1 point.³⁸ Typically, bill

margins are set by taking the current market value of the bills, in terms of their bid price, and rounding down to the nearest convenient number.³⁹ The margin on CD's is computed similarly, although the requirement may vary with the source of the CD, that is, the issuing bank. For coupon securities maturing in 1 year or less, accrued interest in effect serves as a margin, since it is rarely counted as part of the collateral value. In order to reflect the convenience factor in financing bills and CD's and the addition of accrued interest on within-1-year coupon securities, $\frac{1}{4}$ of 1 per cent was applied to bills and CD's and $\frac{1}{2}$ of 1 per cent to the coupon securities.

For coupon securities maturing after 1 year, financing is again handled on a flat basis, that is, excluding accrued interest. For issues maturing in 1 to 5 years, margins ranged from $\frac{1}{2}$ point to 2 points, with the more frequent quotation nearer to 1 point. To make some provision for accrued interest, $1\frac{1}{2}$ per cent was selected for our computations. For issues maturing in 5 to 10 years, quotations ranged from 2 to 5 points but were generally on the lower side. Again, allowing for convenience and accrued interest, 3 per cent was applied to this category. For issues with maturities of over 10 years, margin rates quoted were from 3 to 5 points. In this case, 4 per cent was used for 10- to 20-year issues and 5 per cent for issues maturing after 20 years.

Federal agency securities, having become much more actively traded and widely held, appear to have experienced declining margin requirements over the past decade. In the Meltzer-von der Linde study, 5 per cent was

totals used to compute dollar margin requirements were reported on the basis of par value. Because bill positions were reported at par value, however, aggregate margin requirements for bills may be slightly overstated. In congressional hearings in 1958, a survey indicated that initial margins for loans at commercial banks against collateral (U.S. Government securities) maturing in 1 year or less were as follows: of \$1.95 billion of financing, 47 per cent was financed initially at zero margin, 23 per cent at $\frac{1}{4}$ point or less, 14 per cent at 1 point, 10 per cent at 2 points, and 6 per cent at 3 points or more.

³⁹ For example, a 180-day bill bid at 98.321 might be valued at 98.250 for collateral purposes.

³⁸ Zero margin generally means that the loan is covered by an equivalent dollar amount of collateral securities valued at the bid price. Although a computational distinction between points (\$10,000 per million par value) and per cent of market value exists, the overriding convenience factor has rendered the distinction virtually irrelevant; in this study, there need be no computational distinction because position

applied uniformly to all types and maturities. As of 1967, several sources said agency securities were accorded the same margins as comparable maturities for U.S. Government securities. For agency securities maturing in 1 year or less, a 1 per cent margin was used; for those maturing after 1 year, a 3 per cent margin was applied.

Margin rates for borrowed securities depend on the maturity of the collateral, although the margins are slightly lower in the longer-maturity sectors than they are for direct loans. Less risk of adverse price movements is involved in covering securities borrowed, because the prices of these securities move in the same direction as those that are put up as collateral. (The dollar value of a loan, of course, does not change with security prices.) Margins range from virtually zero on bills to 3 points for securities maturing in over 10 years. However, as a rule of thumb, 2 points is applied to the total collection of securities submitted as collateral against borrowed securities, largely because of the inconvenience entailed in calculating margin allowances for individual issues. A total of two points was therefore applied when estimating total margins on dealers' short positions.

Minimum capital requirements. Applying the margin rates selected in the foregoing discussion, minimum capital requirements were estimated for dealers' average positions from 1960 to 1965, and for the week of highest daily-average positions, that is, August 17–21, 1964.⁴⁰ Position data are given for all dealers, even though bank dealers financed the bulk of their positions themselves and hence were not subject to margin requirements; the importance of this procedure will be noted later. Two methods of calculation were employed. The primary one is based on dealers' gross long

positions; the second, used as a comparative check, is based on the gross short plus net long positions. The results of the first method are presented in detail in Table 10, as are the summary figures for the second method.

A necessary assumption concerning estimates of the minimum amount of capital used is that dealers borrow to the fullest extent possible. This entails using the entire gross long positions as collateral against either direct loans or borrowed securities.⁴¹ Aggregate margins required on the gross long positions, then, are a first approximation of the minimum amount of dealer capital needed to support the observed level—and composition—of positions, without regard for the relative size of the short position. Based on this method, dealers' capital requirements rose from more than \$23 million in 1960 to more than \$40 million in 1965, or by 74 per cent. When net long positions were at their peak during this period, in the week ended August 21, 1964, requirements were \$57 million.

The second approximation of minimum capital needed takes the dealers' short positions into account. When dealers borrow securities to sell short, the proceeds of the short sales can be used to repay outstanding loans and, concomitantly, the released collateral can be shifted to cover the borrowed securities. As noted earlier, when long-term collateral is being used, margin rates are lower when applied to borrowed securities than when applied to direct loans. Moreover, bills sold short are often financed by "due bills," which are unsecured borrowings requiring no margins. Potentially offsetting these margin advantages, however, is the fact that institutions that lend securities require larger margins on Treasury bills when used as collateral than are normally required with direct loans.

By applying the straight 2-point margin—frequently used as a rule of thumb by lenders of securities—to dealers' gross short positions and the previously selected margins to net long

⁴⁰ Data for years prior to 1960 were available only on a net basis, precluding meaningful analysis or interperiod comparisons. Reported on a commitment basis, the position data lead to some overstatement of capital requirements because new security issues are typically taken into position several days (or more) prior to actual issue and payment. This practice occurs largely in bills, however, where the impact on capital is relatively small.

⁴¹ Minimization of capital used does not necessarily imply the least-cost combination of capital and borrowing.

TABLE 10: MINIMUM AGGREGATE CAPITAL REQUIREMENTS FOR FINANCING DEALER POSITIONS, SELECTED PERIODS, BY MATURITY CATEGORY

In millions of dollars

Method and maturity category	1960	1961	1962	1963	1964	1965	Aug. 17-21, 1964
Gross long positions:¹							
Treasury bills (3-month).....	4.14	5.09	6.50	6.31	7.02	7.17	7.21
Coupon securities:							
Within 1 year.....	1.68	2.42	2.70	1.80	1.48	1.31	.92
1-5 years.....	10.04	7.72	6.24	8.20	7.52	5.29	10.93
5-10 years.....	3.14	2.66	4.73	7.15	8.39	8.30	15.62
10-20 years.....	1.15	1.29	1.45	1.24	.44	.75	.79
After 20 years.....	1.24	1.16	1.94	3.14	6.00	10.86	16.30
Agency securities:							
Within 1 year.....	1.19	1.04	1.72	2.16	2.23	2.54	2.51
After 1 year.....	.77	.88	1.24	1.49	1.51	3.85	2.50
Certificates of deposit.....	...	...	...	.10	.53	.56	.55
Total.....	23.35	22.26	26.52	31.59	35.12	40.63	57.33
Gross short plus net long positions:²							
Gross short position.....	5.07	9.13	9.88	11.51	12.39	13.79	9.20
Net long position.....	20.04	15.56	19.36	21.97	24.49	31.20	49.74
Total.....	25.11	24.69	29.24	33.48	36.88	44.99	58.94

¹ Includes long-term repurchase agreements.² Includes long-term repurchase agreements. A margin of 2 points was applied to the entire short position; then selected margins were applied to net long positions in each category.

NOTE.—Figures based on daily-average positions.

positions in each maturity category, aggregate minimum capital requirements were estimated another way. The results, shown in Table 10, were consistently above the totals computed from gross long positions but not by very large amounts; the differences ranged from 5 to 11 per cent. The higher margins imposed on short positions in bills weighed more heavily than reduced margins on long-term collateral securities, but the variation between the two methods is not sufficient to indicate that the relative size of the short positions is an important determinant of capital requirements.⁴²

CAPITAL ADEQUACY

A primary task of this study was to ascertain the sufficiency of dealer capital under current market conditions and to judge its expected availability for accommodating the

near-term requirements of public and private market participants. The foregoing analysis of invested capital and of minimum requirements indicates that adequate amounts of capital were available in 1965 for positioning securities. While capital requirements grew at a faster rate during the 1960's than did the proxies for capital available, the absolute gap between the two widened.

Far from seeing a withdrawal of invested capital in dealer firms, most firms grew in size from 1960 to 1965, and six firms entered the industry. Furthermore, since bank dealers finance the bulk of their positions with their own funds, the potential capacity of the industry grew substantially with the addition of three new bank dealers. Indeed, of the \$18 million increase in required capital from 1960 to 1965, bank dealers accounted for \$9 million. In 1965, the actual amount of capital required—that is, the requirements of nonbank dealers—was just under \$29 million. This can be compared roughly with total nonbank dealer capital of \$261 million and capital of \$86 million allocated to operations in Government securities. With the mobility of funds among firms' various functions, there is little

⁴² Both techniques are subject to similar types of errors, not only with regard to the validity of margin rates applied but also in terms of the practical problems of daily financing activities. In the latter sense, both methods probably underestimate needed capital by implicitly assuming a degree of flexibility and efficiency in the distribution of collateral among lenders not practically feasible under current clearing arrangements. However, the generous estimates of margin rates may offset some of this bias.

doubt that there is sufficient capital available to meet any foreseeable needs in the near future.

The crucial factor, as mentioned earlier, in determining whether public and private operations will be accommodated efficiently is the expected profitability of such accommodation. When profit expectations are favorable, resources can be shifted to Government securities operations by dealers, even to the point where bank dealers may raise additional funds in the CD and Federal funds markets. Alternatively, when prices are expected to decline or when bid-asked spreads narrow to the point where they do not cover the risks of holding

securities, dealers may be unwilling to expand their positions to accommodate official or private operations and may divert resources to other, more profitable uses.

Nothing in the analysis of profits in the early 1960's, however, indicated that dealer net income—and return on capital—would remain permanently at low levels. Therefore it is likely that dealers will continue to respond to profit opportunities as they arise. Nevertheless, efforts to prevent deterioration in market performance, however defined, can succeed only if there is reasonable assurance of adequate profits. Capital will be more than sufficient if this occurs.

V. RATE OF RETURN ON CAPITAL

Computing a meaningful rate of return for capital employed by dealers in their U.S. Government securities operations is severely hampered by the problems inherent in specifying and measuring the appropriate capital base and in making the proper allocations of income and expenses to this and closely related functions. Furthermore, it is almost impossible to assess the returns that may accrue to the diversified dealers that make markets in U.S. Government securities. Nevertheless, the rates of return reported by Meltzer-von der Linde for 1948–58 are presented in Table 11. These data refer to income from all operations of nonbank dealers.

The Benston study did not provide sufficiently detailed figures to permit meaningful calculations of return on capital for 1959–63. Capital data were for nonbank dealers only whereas income data were for all dealers. Clearly, the return was very high in 1960 and quite low in 1963.

For 1964 and 1965, nonbank dealers estimated that they had allocated \$82.2 million and \$85.5 million, respectively, of capital to their Government securities operations. Based on these figures, the rates of return were 3.7 per cent in 1964 and –12.3 per cent in 1965

before taxes. When the combined operations of each nonbank dealer were examined, however, the rates of return on net worth averaged 26 per cent (1964) and 27 per cent (1965). In both years, as might be expected, the highest rates of return were achieved primarily by the larger, diversified firms. In 1965, when 10 of the 12 nonbank dealers reported losses in Government securities operations, 5 had overall profits and 4 of these were the large diversified dealers.

TABLE 11: RATIO OF AGGREGATE NET INCOME TO NET WORTH, NONBANK DEALERS, 1948–58

In per cent

Year	Ratio
1948.....	1.2
1949.....	17.0
1950.....	–.8
1951.....	4.3
1952.....	7.8
1953.....	25.6
1954.....	24.2
1955.....	2.3
1956.....	.2
1957.....	42.4
1958.....	58.1

NOTE.—Ratios are based on complete reports from 7 to 10 dealers. Net income is before taxes and after special charges or gains; net worth includes long-term financing. Although nonbank dealers had a net gain in their securities operations in 1955, bank dealers had a net loss, which caused the whole industry to sustain a loss on operations.

SOURCE.—U.S. Congress, Joint Economic Committee, *A Study of the Dealer Market for Federal Government Securities*, by Allan H. Meltzer and Gert von der Linde, Joint Committee Print (Washington, D.C.: Government Printing Office, 1960), p. 133.

Some comparison of rates of return in similar fields such as among brokerage or investment firms has been undertaken. Any comparison of this nature, however, suffers from difficulties that are more extensive than simply allocating capital and income. Foremost are the problems of average versus marginal measurement, and the specification of a risk differential. Currently available data on income and capital allow computation only of average rates of return for extended periods of time. The crux of efficient capital allocation, however, is the marginal rate of return, that is, the change in income per marginal change in capital. In a diversified dealer firm, where considerable portions of capital are mobile, average rates of return to various functions may differ although marginal rates are equal. Similarly, average rates may differ among firms and yet marginal rates may be equal. Thus, differences in observed average rates of return provide no

predictable clue about potential capital movements.

The second, and perhaps more important, constraint on interindustry comparisons is the problem of assigning a risk component to rates of return in order to reflect the riskiness of various types of enterprise. It may be reasonable to assume that Government securities dealers should receive greater risk-compensation per unit of invested capital—given the risks associated with highly leveraged positions and volatile prices—than, say, brokerage firms with minimal capital risk exposure; how much greater this compensation should be, however, is a matter of conjecture. Indeed, given the very wide cyclical swings in earnings and the difficulties in quantifying nonmarket factors—Federal Reserve support of rates just after World War II, for example—it is impossible to generate a reliable long-run rate of return for the U.S. Government securities industry.

VI. APPENDIX

SUMMARY OF DEALER INCOME AND EXPENSES, 1964 AND 1965

A statement of aggregate income on the U.S. Government securities operations of the 12 nonbank dealers in 1964 and 1965 and the 8 bank dealers in 1965 is presented in Appendix Table 1. In 1965 nonbank dealers incurred an aggregate loss of \$9.9 million, before allowance for income taxes, from these operations; only 2 of the 12 dealers realized a profit. In contrast, 9 firms had shown a profit in 1964 and their combined pre-tax net income had totaled \$3.1 million. Bank dealers had similar difficulties in 1965; as a group they lost \$4.5 million. Only one bank reported a net gain.

The primary cause of net losses in 1965 was the extremely low level of trading profits, particularly on coupon securities. Spread profits for coupon issues, based on annual sales and

quoted spreads of the several maturity categories, were estimated at \$68 million for total coupon sales, although substantial downward adjustment, perhaps by about one-half, is necessary to account for the fact that actual spreads were well inside the announced quotations. Still, all dealers had combined trading profits of only \$9.4 million on these issues, or little more than one-fourth of potential gross revenues had there been no capital losses; declining prices on securities held in position in effect wiped out three-quarters of the estimated spread profits.

Trading profits on Treasury bills, included in interest income in these figures, were not separated from accrued discount (interest) by most firms. Based on the performance of five nonbank dealers and four bank dealers that were able to segregate trading profits from discount (interest) earned on bills, aggregate trading profits on bills in 1965 were estimated to be about \$6 million. This compares with potential spread profits of \$10 million.⁴³ The relatively smaller contraction of trading profits on bills vis-a-vis coupon securities presumably stemmed in part from the smaller impact on bill prices of a given change in interest rates.

Based on the estimated \$6 million of trading profits on bills—\$4 million for nonbank dealers and \$2 million for bank dealers—net carry for all dealers showed a deficit of approximately \$3.7 million. Nonbank dealers sustained the entire loss since bank dealers were estimated to have broken even on the financing of their positions. Bank dealers typically employed as the cost of carry the rate on Federal funds or the 3-month bill rate, both of which were somewhat below nonbank dealers' borrowing rates in 1965.

APPENDIX TABLE 1
DEALER INCOME AND EXPENSES ON
GOVERNMENT SECURITIES OPERATIONS,
AND NONBANK DEALER NET INCOME
FROM ALL OTHER ACTIVITIES,
1964 AND 1965

In thousands of dollars

Government securities operations	Nonbank		Bank
	1964	1965	1965
Income:			
Trading profits on coupon securities	14,600	6,762	2,645
Unrealized appreciation or depreciation on securities owned	493	-910	-1,193
Interest, dividends, and discount earned	102,590	113,569	35,941
(Income from Treasury bills)	(67,859)	(75,091)	(20,183)
Other income	46	173	82
Total income	117,728	118,394	37,475
Expenses:			
Interest on borrowed funds	98,023	112,286	33,891
All other expenses	16,630	16,169	8,069
Total expenses	114,653	128,455	41,960
Net income before taxes	3,076	-9,862	-4,484
Net income before taxes from all other activities	56,611	78,615	...

¹ Includes Federal agency securities and CD's.

NOTE.—Figures may not add to totals due to rounding.

⁴³ The quoted spreads on Treasury bills, used for estimating spread profits, are probably quite close to actual spreads.

REGRESSION EQUATIONS

APPENDIX TABLE 2
LIST OF INDEPENDENT VARIABLES FOR MULTIPLE REGRESSIONS

Symbol	Variable	Unit
X_1	Quoted bid-asked spread on the new 3-month Treasury bill, monthly averages of Thursday observations	Basis points
X_2	Total sales, nonbank dealers, monthly averages of daily figures ¹	Millions of dollars
X_3	Bill transactions, all dealers, monthly averages of daily figures	Millions of dollars
X_4	Coupon transactions, all dealers, monthly averages of daily figures ¹	Millions of dollars
X_5	Change in end-of-month, 3-month bill rate	Percentage points
X_6	Monthly change in long-term U.S. Government bond rate (Federal Reserve series), monthly averages of daily figures	Percentage points
X_7	Change in 3-month bill rate, last 3 days of preceding month	Percentage points
X_8	3-month bill rate, monthly averages of daily figures	Percentage points
X_9	Bill positions, all dealers, monthly averages of daily figures	Millions of dollars
X_{10}	Coupon positions, all dealers, monthly averages of daily figures ¹	Millions of dollars
X_{11}	Total positions, all dealers, monthly averages of daily figures ¹	Millions of dollars
X_{12}	Dummy variable, +1 for all months, January 1958-April 1960	
X_{13}	Dummy variable, +1 for refunding months in 1960-63	

¹ Includes Federal agency securities and CD's.

APPENDIX TABLE 3
MULTIPLE REGRESSION RESULTS EXPLAINING NONBANK DEALER TRADING PROFITS PLUS CARRY

Equation and period	R ² adj.	Durbin-Watson ratio	Net regression coefficients and standard errors										
			Constant (standard error of λ_0)	λ_5	λ_6	λ_7	λ_8	λ_9	λ_{10}	λ_{11}^*	λ_{12}^*	λ_{13}	λ_{14}
I—1958-1963	.69	1.95	465.41 (116.78)	-269.65† (431.23)	-776.54†† (192.82)	-698.85†† (155.33)	-48.26†† (15.37)	88.70†† (21.55)	-933†† (97.04)	...	...	...	-45.71†† (31.66)
1958-Apr. 1960	.61	1.32§	492.63 (144.95)	-258.13†† (65.07)	-491.46† (323.54)	-719.37†† (224.83)	42.87† (34.89)	...	...	...	...	...	-31.66 (29.10)
1961-1963	.31	2.42	374.71 (91.04)	-308.03†† (138.34)	-890.66†† (311.35)	-9.65 (479.09)	12.29 (50.08)	80.56 (45.50)	...	...	...	...	-73.04† (49.03)
II—1958-1963	.67	1.91	380.12 (100.26)	-257.54†† (44.38)	-715.82†† (200.45)	-689.59†† (129.49)	44.00†† (22.44)	100.03†† (49.69)	-933†† (97.04)	...	...	...	...
1958-Apr. 1960	.64	1.43	440.26 (140.24)	-244.38†† (63.34)	-491.46†† (309.55)	-722.49†† (205.40)	22.87†† (33.33)	...	...	...	...	...	...
1961-1963	.44	2.61	387.54 (82.63)	-350.20†† (141.37)	-1176.46†† (279.90)	-101.88 (428.77)	2.45 (49.75)	-4.38 (44.87)	...	...	...	...	...
III—1958-1963	.68	2.02	374.60 (119.34)	-248.54†† (44.50)	-656.25†† (203.38)	-626.64†† (156.61)	38.19†† (22.36)	89.74†† (49.85)	-931†† (97.04)	...	...	...	...
1958-Apr. 1960	.62	1.39	402.86 (133.96)	-251.47†† (56.08)	-452.09†† (296.47)	-724.38†† (205.23)	22.87†† (33.01)	...	...	...	...	...	...
1961-1963	.44	2.69	358.73 (82.65)	-322.93†† (144.03)	-1068.24†† (300.34)	-145.28 (431.07)	2.63 (44.88)	4.63 (44.88)	...	...	...	...	...
IV—1958-1963	.70	2.02	449.57 (115.19)	-246.31†† (42.32)	-730.90†† (191.60)	-607.54†† (151.22)	39.07†† (22.06)	80.19†† (46.66)	...	...	...	...	...
1958-Apr. 1960	.67	1.40	716.72 (133.96)	-249.18†† (56.08)	-483.40†† (296.47)	-757.61†† (205.23)	28.45 (33.01)	...	...	...	...	...	...
1961-1963	.31	2.37	391.87 (91.87)	-308.03†† (159.28)	-890.66†† (309.47)	-9.65 (479.77)	12.29 (50.08)	80.56 (45.50)	...	...	...	...	...
V—1958-1963	.68	2.01	453.97 (100.26)	-263.86†† (44.38)	-697.21†† (200.45)	-607.34†† (129.49)	40.60†† (22.44)	57.25 (49.69)	-939†† (97.04)	...	...	...	...
1958-Apr. 1960	.63	1.49	496.73 (141.18)	-269.72†† (62.89)	-411.41†† (312.11)	-604.12†† (244.06)	35.69 (33.57)	...	...	...	...	...	...
1961-1963	.26	2.44	216.36 (94.91)	-351.06†† (164.01)	-954.67†† (329.71)	-101.79 (492.33)	31.43 (56.75)	35.54 (59.61)	...	...	...	...	...

* Two-tailed test for significance. All other variables have one-tailed test.

† 10 level of significance for Student's t value.

†† .05 level of significance for Student's t value.

§ Low Durbin-Watson ratio indicative of significant positive serial correlation at .05 confidence level

MEASUREMENT OF DEALER CAPITAL

Nonbank Dealers. The broadest measure of nonbank dealer capital is net worth—the accounting residual of assets over liabilities. It has the advantage of being easily calculated and it does provide an indication of the risk protection afforded creditors. Moreover, it is the only available statistical measure of dealer capital for the 1958–63 period.

A narrower measure of capital, and one which more closely reflects a dealer's ability to expand positions, is capital available. Capital available represents the amount of capital that management is able or willing to commit to the financing of Government securities. If not formally allocated by management, it is essentially net worth minus all assets not serviceable as loan collateral to finance positions. Specifically excluded, for example, would be furniture and fixtures, good faith deposits, stock exchange memberships, and the minimum capital requirements for such memberships and for other firm activities.

Finally, there is a third potential measure, capital in use, which is the amount of funds actually committed as margins for financing positions. In practice, it is the excess of market value of securities positions, including accrued interest, over the value of loans against which such securities have been pledged.

There is considerable evidence that all three concepts were used in the most recent figures on allocated capital collected by the Market Statistics Division of the Federal Reserve Bank of New York. However, some dealers, lacking allocative guidelines, presented figures unrelated to any of these concepts.

Capital available is undoubtedly the appropriate measure for position expandability, unless there is a policy limit set by management on the amount of capital that may be devoted to Government securities financing. As for calculation, it should not be difficult for management to provide a realistic estimate of the amount of capital that is potentially available. A serious drawback to the use of such a figure as a guideline to expandability, however, is

that capital available may not be stable but may be a function of the perceived profitability of a particular situation and of the relative profitability of alternative uses of funds at any particular time. For example, a lucrative corporate underwriting may pre-empt capital normally committed to financing a Treasury refunding operation.

In selecting a meaningful base to measure profitability, one should remember that potential biases exist in both the capital-available and the capital-in-use concepts. For example, in assessing the capital-in-use concept, any capital not employed in other activities—that is, some additional amount of capital available—because it is being held in reserve for financing Government securities, would not be incorporated in the base. In this case, profitability would be overstated. Alternatively, a capital figure for firms that deal in both U.S. Government and other securities would certainly include funds that are normally used for operations in other securities; this would lead to an overstated base and to an understated figure for profitability. At nondiversified firms, of course, both concepts would result in the same capital figure.

Dealers in other than U.S. Government securities may not necessarily squeeze borrowings to the limit—that is, always borrow with minimal margins, siphoning off or adding capital as the level of positions requires. In questioning whether or how much capital in excess of the minimum required is included in observed capital in use by diversified dealers, a feasible normative assumption is suggested: namely, that dealers faced with alternative applications of limited capital equate the marginal benefits of allocating funds to each activity.¹³ Under such a plan capital would be committed to maintaining Government securities positions when it is profitable to do so. When competing needs for capital are slack,

¹³ Dynamically, capital flows are created by shifts in the marginal revenue functions of various activities arising from changing market conditions, expectations, and opportunities for capital use in each activity.

presumably borrowings would be minimized, but this would be a function of financing charges.

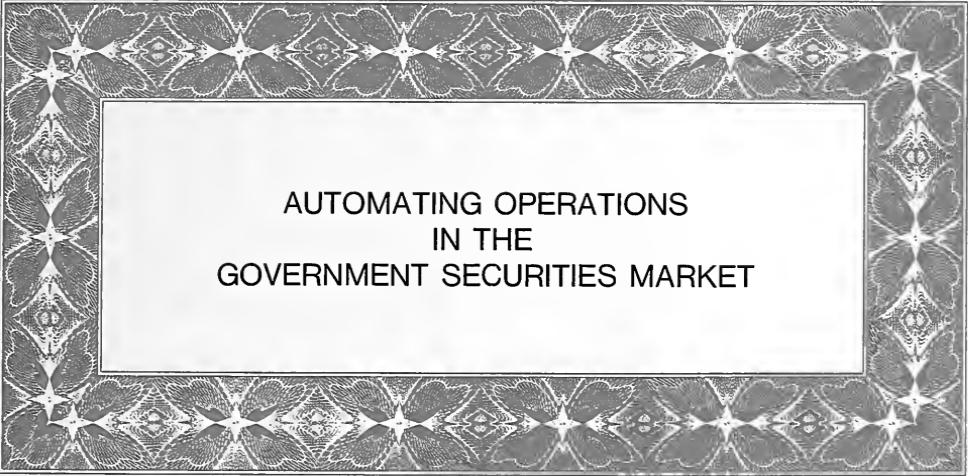
Bank Dealers. A capital measure criterion for bank dealers is virtually meaningless, because capital does not function as a constraint on position expansion, nor is it used for calculating profitability. In sum, the concepts of capital available and capital in use have no useful interpretation in the bank dealer situation.

The expansion of positions in Government securities in the dealer operations of banks is constrained by formal or informal position limits set by management, usually for several maturity categories. Under certain conditions, these maximum levels may be exceeded at the discretion of management; alternatively, expansion of dealer positions may be restrained by factors not directly related to the dealer role. In particular, several bank dealers provide considerable assistance to their banks in adjusting the banks' reserves, often through short sales or the placing of repurchase agreements. Even though the dealer operation is theoretically divorced from management of the investment portfolio, it is often integrated both physically and operationally with the money management centers. In short, no matter what the formal maximums may be, expandability may be determined in large part by bank liquidity needs, which may run counter to securities market considerations even when profitability of the latter is adequate.

It is difficult to estimate profitability for this group of dealers. In the first place, bank dealers may borrow more heavily in the Federal funds market purely to support dealer positions, on the theory that the larger borrowings are offset by the liquidity of these positions. To this extent, no bank capital is committed; the margin in this case is simply the good name of the bank. Secondly, there is the problem of defining an appropriate opportunity cost for the amount of funds in use—be it deposits (and capital) or borrowings—that would have been allocated to other bank activities.⁴⁵ This is perhaps one reason why bankers, who only recently have experimented with functional cost analysis, have not developed standards for judging dealer profitability. To quote one banker, “. . . a black figure is good; the bigger, the better.”

Finally, banks differ in their use of the dealer operation for servicing customers and, as previously noted, in their assistance in adjusting reserve positions. Because many dealers are operationally integrated with other money management functions, the difficulties of allocating expenses properly, combined with the tangible costs and the intangible returns from servicing customers and assisting reserve adjustment, render any statement of profitability tenuous at best.

⁴⁵ Differences in risk between U.S. Government securities operations and other uses of funds would also have to be taken into account in comparing returns on funds in use.



AUTOMATING OPERATIONS
IN THE
GOVERNMENT SECURITIES MARKET

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Government Bond and Safekeeping Department
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I. INTRODUCTION

The market in securities of the U.S. Government as known today—so important both to fiscal policy and to the well-being of our economy—had its beginnings in the expansion of trading that was accomplished through the issuance of Liberty Loan Bonds during World War I. With the exception of the Federal Reserve System's telegraphic facilities for transferring securities, introduced in 1921, the decades since World War I have seen few changes in the cumbersome and time-consuming practices observed in issuing, receiving, and delivering Government securities. The purchases and sales made by the primary dealers in U.S. Government securities frequently number in the thousands on a single day, and so it is apparent that an enormous amount of unnecessary time and effort is expended in completing individual transactions by physical delivery of the securities concerned.

In mid-1965 a beginning was made toward reducing the need for individual deliveries of Government securities; an experimental clearing arrangement was created that was applicable to transfers of securities between two New York City member banks and banks in other Federal Reserve districts through the Federal Reserve System's telegraphic transfer facilities.

NOTE.—Many aspects of the clearing and book-entry procedures have been improved and expanded since this paper was prepared in June 1969. In addition, the clearing participants currently include all 12 member banks of the New York Clearing House Association.

This paper describes that clearing arrangement, which includes 8 of the 11 New York City member banks whose operations in the Government bond market, either directly or as clearing agent for nonbank dealers, are sufficiently broad to warrant their participation in such an arrangement. Of even greater importance, the clearing concept now encompasses local transfers of Government securities among the participants in New York City, in addition to the interdistrict transfers for which it was originally designed. A brief illustrated description of the various types of transfers of Government securities eligible for inclusion in the clearing arrangement appears in Charts 1 through 3.

At the same time that the securities clearing arrangement was being developed in New York, plans were also being formulated within the Federal Reserve System for the establishment of a book-entry procedure in connection with the issuance and custody of U.S. Government securities held by the Reserve Banks for member banks and certain other market participants that maintain securities accounts with the Reserve Banks. Among other things, the book-entry procedure will contribute to the further development of the securities clearing arrangement by eliminating the need to settle the daily net clearing balances by the delivery of definitive securities. This prospect and other important implications of the book-entry concept are discussed in this paper.

II. SECURITIES CLEARING ARRANGEMENT

CLEARING TELEGRAPHIC TRANSFERS OF GOVERNMENT SECURITIES

From time to time, the Federal Reserve Bank of New York has considered various proposals to reduce the substantial volume of Government securities that are delivered daily to and from the Bank, as fiscal agent of the United States, in connection with interdistrict telegraphic transfers of such securities among Federal Reserve cities. Early in 1965 the Bank formulated a proposal designed to achieve this objective.

In essence, the proposal contemplated a clearing arrangement between the Reserve Bank and seven of the major New York City member banks¹ that would provide for the establishment of securities clearing accounts at the Reserve Bank in the name of each participating bank; in lieu of the physical deliveries of securities by or to the New York City member banks in connection with each individual telegraphic transfer, appropriate entries would be made in the clearing accounts by means of closed-circuit teletype notification to or from the bank concerned. Settlement of the securities owing at the close of business each day, based on the net balances in the securities clearing accounts of each participant, would be made by deliveries of securities at the Reserve Bank, in the amounts indicated by such balances, at or after the close of business. It was estimated that, over all, this clearing process would result in reducing by about 80 per cent the burden of physically handling the securities associated with these transactions.

Following discussion of this proposal with the Treasury Department, the Bank received Treasury approval early in 1965 to conduct a pilot-test operation of such a clearing arrange-

ment with Morgan Guaranty Trust Company. The pilot test was begun in July of that year and in August was extended to include Irving Trust Company. On the basis of the successful test experience, Bankers Trust Company and Manufacturers Hanover Trust Company were invited to join the operation in mid-1966, followed successively by First National City Bank, Chemical Bank New York Trust Company, Chase Manhattan Bank, and the Bank of New York.

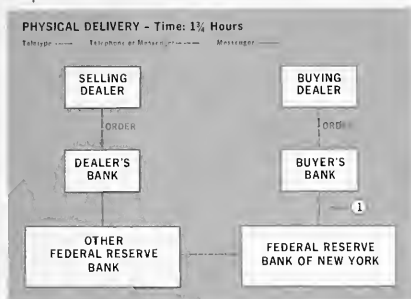
With these additional banks the clearing arrangement had grown to include as active participants 8 of the 11 New York City banks² whose operations in the Government bond market, either directly or as clearing agent for nonbank dealers, were on a scale broad enough to make participation in a local clearing arrangement attractive and efficient.

During the initial stages of the clearing arrangement, questions necessarily arose about the limitations on participation that should be established. For example, although it was originally contemplated that the arrangement would extend only to the seven largest member banks in New York City—and through them to the principal dealers in Government securities—a number of exploratory inquiries were received regarding direct nonbank dealer participation. It did not appear necessary or appropriate for the Bank to enter into direct arrangements with nonbank dealers so long as their clearing needs were adequately served by the member banks in the clearing group. Similarly, the Bank believed that dealer banks located in other districts could and should participate in the clearing arrangement through the facilities offered by participating member banks in New York City.

¹ Bankers Trust Company, Chase Manhattan Bank, Chemical Bank New York Trust Company, First National City Bank, Irving Trust Company, Manufacturers Hanover Trust Company, and Morgan Guaranty Trust Company.

² Franklin National Bank became the ninth active participant in June 1969. Marine Midland Grace Trust Company and United States Trust Company have joined in signing the clearing agreement but have no immediate plans for active participation.

1 | CPD TRANSFER



TIME: 1½ Hrs. In a typical CPD transfer, a seller in San Francisco, for example, delivers Government securities to the Reserve Bank in that city; that Bank "retires" the securities surrendered and sends teletype instructions to the Reserve Bank in New York City to "issue" a like amount of the same securities to the purchaser. Upon receipt of the telegraphic order, the New York Reserve Bank normally withdraws the securities from its unissued stock and delivers them to the purchaser or its clearing bank over the counter (see 1 on chart). This involves several counting and examining operations by the Reserve Bank as well as by the bank or dealer accepting delivery of the securities, which must be individually transported to the offices of the bank or dealer. In effecting this physical delivery approximately 1 hour and 45 minutes will elapse from receipt of the teletype message by the Reserve Bank until receipt and final processing of the securities at the office of the New York bank or dealer.



TIME: 2 Min. Compared with the present procedure, the same delivery of securities involved in telegraphic transfers can be accomplished by a teletype notification from the New York Reserve Bank to the New York City participant (see 2 on chart). Such notification includes all the particulars of the transfer and permits the recipient to readress the securities, in whole or in part, to any other participant in the arrangement where necessary. Since physical handling of the securities is eliminated at this stage, no more than 2 minutes' elapsed time is required to complete an incoming telegraphic transfer as compared with nearly 2 hours when physical delivery is made. At the end of the day, of course, physical settlement is made by the Reserve Bank with each participant, based on the net amounts of securities of each issue in which transfers took place that day.

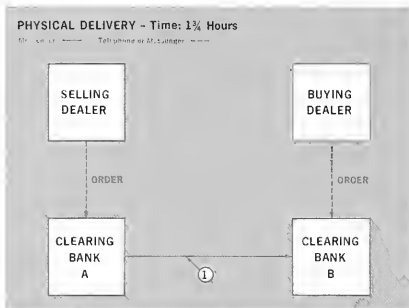
NOTE.—CPD transfers are so named because transfers between Federal Reserve Banks originally had to be approved by the Commissioner of Public Debt, U.S. Treasury Department.

DEVELOPMENT OF A FULL-SCALE GOVERNMENT SECURITIES CLEARING ARRANGEMENT

The Reserve Bank's experience in conducting the initial clearing arrangement soon established that (1) there was a considerable and increasing volume of transactions among the principal local banks that involved the physical delivery and receipt of Government securities, other than those related to interdistrict transfers, and (2) there was also interest on the part of the New York City banks and of the larger nonbank dealers in Government securi-

ties in the development of an effective mechanism for clearing these intracity member bank transactions. On the basis of this knowledge, the Bank initiated in January 1966 a series of discussions with members of the New York Clearing House Association; the discussions were aimed at the development of a workable arrangement for clearing all transactions in Government securities that in any way involved the large New York City banks. In support of its view that the present "clearance and payment facilities underlying the market for U.S. Government securities are less than ade-

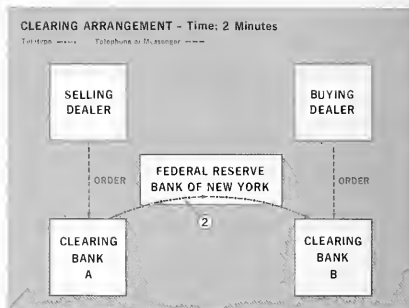
2 | LOCAL NEW YORK CITY TRANSFER



TIME: 1 3/4 Hrs. In fulfilling a typical sale of Government securities by one dealer to another located in the same city, the seller will order his clearing bank to deliver a stated amount and issue of securities to the other dealer, usually through the clearing bank of the latter, against a stated payment. Completion of such a transaction necessarily involves withdrawal of the securities from a vault or other repository at Bank A, several counting and examining operations at that bank, and finally delivery by messenger to Bank B (see 1 on chart) where the counting and examining process is repeated and the securities are ultimately deposited in custody for the account of the buying dealer. Not until the recipient bank has verified the correctness of the securities received is payment for the transaction effected, usually by sending a Federal funds payment through the wire transfer facilities of the Federal Reserve Bank. On average, such a transaction requires at least 1 hour and 45 minutes for completion.

quate," the Clearing House prepared a paper stating in some detail the deficiencies in the available market mechanism and the steps that should be taken to remedy them.

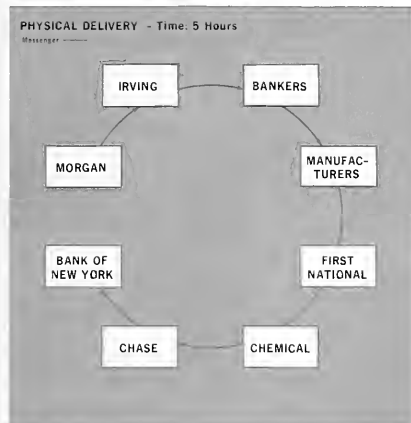
The paper included the observations that the development of a central clearing arrangement could substantially relieve the strain on present facilities, would be in the public interest, and would facilitate the implementation of monetary and debt management policies in a growing economy. Other material developed as part of the over-all Treasury-Federal Reserve Study of the U.S. Government Securities Market also refers to the need for a central clearing arrangement and for automated procedures for centrally recording the ownership of Government securities.



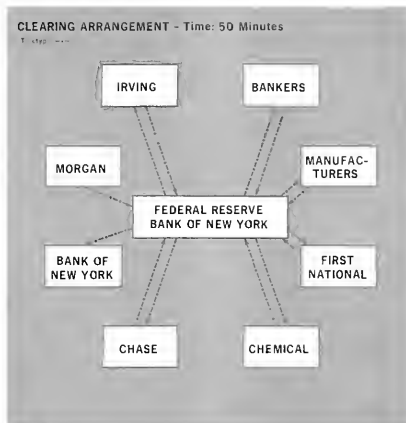
TIME: 2 Min. Compared with the present procedure, the same delivery of securities can be accomplished through the Federal Reserve clearing arrangement by means of a simple teletype message from Bank A addressed to Bank B (see 2 on chart). Such message includes pertinent information concerning both the selling dealer and the purchasing dealer, and results in adjustments in the securities clearing accounts of the two participating banks on the books of the Reserve Bank. No movement of securities is required for individual transactions, settlement being made on the basis of the net balance at the end of the day; and payment for the transaction is debited and credited to the reserve accounts of the respective banks coincident with the transfer of securities.

In the course of discussions with the Clearing House banks, it became evident that a clearing arrangement that would include intracity transactions in Government securities could be developed only through the temporary daily use, in connection with the daily clearing settlements, of the stock of unissued Government securities held at the Reserve Bank as fiscal agent of the United States. Proceeding on this premise, counsel for the Bank drafted an agreement involving both interdistrict and intracity transfers; the agreement, following approval by the 10 New York Clearing House banks, became effective in August 1967, superseding previous letter agreements. The clearing of intracity transfers had earlier been approved in principle by the Treasury Depart-

3 | MULTIPLE TRANSFER, Involving All Participating Banks



TIME: 5 Hrs. In a hypothetical case, if a given lot of securities were sold by one bank (or dealer) to another, then resold by the buyer to a third bank, and so on, it is estimated that the various withdrawal, counting, and delivery operations necessary to move the securities through the series of banks would require at least 5 hours to complete. In addition, there is serious doubt as to whether the last one or two banks in the series would be willing to accept delivery considering the established closing hours for the receipt of Government securities.



TIME: 50 Min. Under a clearing arrangement whereby deliveries of Government securities are effected by teletype notification through the Reserve Bank, it is necessary only for the first bank to send teletype instructions to the Reserve Bank, which relays them to the bank addressed, which in turn sends a teletype order to the third bank, and so on. Under this arrangement the only time required to complete all of the hypothetical transactions is that involved in receiving and retransmitting tape messages, which should not exceed an aggregate of 50 minutes. Physical settlement for these transfers would be effected for the net amounts of securities received or delivered at the end of the day and, in the hypothetical case described, the first bank in the series would owe the Reserve Bank the securities that would be delivered to the last bank in the series.

ment, with the understanding that any additional costs incurred by the Reserve Bank because of processing the local transactions would be shared by the participating banks and would not be borne by the Treasury Department.

Although all inbound interdistrict transfers—whether “free”³ or against payment—were eligible for clearing through the arrangement, outbound transfers were limited at the outset

³ A free transfer occurs when the payment associated with the sale of the securities has been effected separately from the transfer itself; payment is not required as a condition to the delivery of the securities.

to those made against payment. Subsequently, provision was made for the inclusion of outbound as well as inbound free transfers, either interdistrict or intracity, predicated on an agreement under which the participating banks undertook to indemnify the Reserve Bank against loss in the event of nondelivery of balances owing to the Bank.

The processing of intracity transfers through the clearing arrangement has proved valuable to the participating New York City member banks and to the nonbank dealers they serve, even though it has been necessary to limit the total volume of these transactions until suitable

electronic data processing equipment can be put into operation by the Bank. Such equipment will have the capability of switching transfer instructions automatically; at the same time it will be capable of capturing all pertinent information for clearing and accounting purposes—including the development of net securities balances of the various participants—and for the entry of debits and credits—representing payments for the securities transferred—to the reserve accounts of the member banks concerned. Until this electronic equipment is installed, messages must be relayed and settlement positions developed by manual methods. Accordingly, the volume of intracity transactions must be kept within manageable limits by establishing relatively high dollar amounts per transaction (in 1969, \$250,000) as the minimum eligible for handling through the clearing arrangement.

OTHER TRANSACTIONS PROCESSABLE THROUGH CLEARINGS

There is a substantial amount of daily traffic between the Reserve Bank and the New York City banks and dealers in connection with the "splitting," or denominational exchanges, of Government securities. The rapid completion of such exchanges can often be a critical factor in making physical deliveries on a timely basis. In order to expedite these denominational exchanges, the clearing arrangement was broadened, effective in January 1969, to allow the participants to request the "change" they required over the clearing teletype facilities, thereby deferring the inclusion of the larger-

denominated certificates until the net settlement of balances each day.

As another means of encouraging the maximum use of the clearing arrangement, banks and other institutions subscribing to new issues of Government securities—such as the weekly Treasury bill offerings—are permitted to take delivery of those securities, in whole or in part, as a credit to their clearing account for the issue in question. Inasmuch as a considerable portion of such newly issued securities is destined for transfer by wire to other local clearing banks, or to other Federal Reserve Banks and branches, on the issue date, this use of the clearing arrangement can eliminate a great deal of unnecessary physical handling for all concerned.

Looking forward to the time when most of the transactions involving the principal dealers in Government securities will be accommodated by the clearing arrangement, the scope of the clearings could be broadened to include securities issued by agencies of the United States—a possibility that is discussed later.

The principle of clearing and settling for valuables on a net balance basis is not new, nor is the use of telegraphically communicated information to effect the transfer of securities between a seller and a purchaser. However, the combination of these two established concepts in the current clearing arrangement, supported by the high-speed switching and data processing capabilities offered by today's electronic computers, can assist in coping with the rapidly growing physical burden that is already taxing the resources of large-volume handlers of Government securities.

III. BOOK-ENTRY PROCEDURE

In June 1963 the Board of Governors of the Federal Reserve System suggested that the Conference of Presidents of the Federal Reserve Banks consider adopting a book-entry arrangement for Government securities held in custody by Federal Reserve Banks for their member banks as a means of freeing vault space, reducing the burden of cutting coupons and collecting interest, and minimizing the risk of misplacing securities of high value. Following a study of this proposal by the Reserve Banks, discussions were held with officials of the Treasury Department and performance tests were conducted at selected Reserve Banks. Meanwhile, counsel for the Reserve Banks in association with counsel for the Treasury continued to review the legal implications of the proposed book-entry procedure. The proposal was approved in principle by the Conference of Presidents in December 1965.

By means of the book-entry procedure approved by the Conference of Presidents, the Reserve Banks may discontinue issuing definitive securities for placement in the custody accounts affected and instead may rely on a computer-based system of book-entry securities. Originally, the book-entry procedure applied only to Government securities held for member banks as (1) free safekeeping deposits, (2) collateral to Reserve Bank advances, and (3) collateral to Treasury tax and loan accounts and other public deposits. Pursuant to specific regulations governing book-entry accounts formulated by the Treasury Department, the program was put into effect at the various Federal Reserve offices on January 1, 1968, and all holdings of Government securities at such offices for the three types of accounts were converted to a book-entry basis by the end of that year. In addition, a number of custody accounts maintained by the Federal Reserve Bank of New York for the Treasury Department and for various international organizations were converted.

While not expressed in the approval of the Conference of Presidents, adoption of the book-entry procedure for safekeeping accounts effectively brought to an end the longstanding policy of the Reserve Banks against the acceptance of safekeeping deposits from banks located in the central financial districts of their respective cities—a policy initiated primarily because of the limited vault facilities available at the Reserve Banks. However, because the book-entry procedure as first promulgated was confined to the investment holdings of member banks, and because there is a considerable amount of movement between member bank holdings and securities held by city banks as custodians for their correspondent banks, trust accounts, and others, including pledged accounts, member banks made little response to the offer of this new service. In addition, banks have been reluctant to put any of these securities under the book-entry system because of the Internal Revenue Service (IRS) rulings regarding the identification of such book-entry securities for tax purposes.

As a major step toward overcoming some of the obstacles impeding the full-scale use of the book-entry procedure, the Treasury Department is revising and broadening its applicable regulations to permit the conversion of certain third-party accounts to a book-entry basis. This revision, though applicable at the outset to pledged accounts of the types currently in effect at the Federal Reserve Banks and branches, nevertheless opens the door to the inclusion of additional categories of accounts maintained by member banks subject to the orders of others, such as correspondent banks, trust accounts, and nonbank dealers in Government securities. Coincidentally, attempts are being made to bring about a modification of the IRS regulation on book-entry securities, which if successful should simplify the carrying out of transactions in these accounts.

Although large-scale adoption of the book-

entry procedure by banks in the central financial districts would present no difficulties in terms of maintenance by the Reserve Bank of the required book-entry records, it could generate a substantial amount of daily traffic because of requests from depositors for physical delivery of securities to their representatives or to others for their account. As discussed in the following section, however, the effects of this increased activity, at least at the Federal Reserve Bank of New York, will be reduced to the extent that the securities can be transferred among participating banks through the existing securities clearing arrangement, which requires only teletype notification rather than physical delivery.

Plans have been made to convert the securities in the System Open Market Account to a book-entry procedure. At some future date

discussions will be held with foreign central banks with a view to converting their holdings to a book-entry system also. The inclusion of the Open Market Account and the New York Reserve Bank's foreign accounts in the book-entry procedure would greatly facilitate the movement of securities resulting from the purchase and sale transactions between these accounts and member banks.

Still further in the future may be the extension of book-entry arrangements at one or more Reserve Banks to accommodate virtually all owners of Government securities—including nonbanking institutions and individuals—through member banks. Once the principle of relatively unlimited computer storage capacity is accepted, there would be no insurmountable barriers to the furnishing of book-entry custody service to all types of holders.

IV. EFFECTING CLEARING SETTLEMENTS THROUGH BOOK-ENTRY

As already discussed, the book-entry procedure that was adopted by the Federal Reserve Banks in January 1968 was restricted to Government securities owned by member banks and deposited with their Reserve Banks to be held either in free safekeeping, or as collateral to Reserve Bank advances, Treasury tax and loan accounts, or public deposits. Within a short time, however, the book-entry concept could be extended to apply to all Government securities held by member banks for their own or for other accounts, thereby encompassing a number of additional categories of holdings—including pledge arrangements—not provided for under the present system.

The development of the Government securities clearing arrangement has been accompanied by a gradual broadening of the types of transactions covered. For example, while inter-district transfers of securities between Federal Reserve Banks and branches are restricted to bona fide sale transactions or to the borrowing or the return of securities by a primary securities dealer, no such limitation has been applied

to the intracity transfers. As a consequence, the local transfer activity will be increasingly expanded to include transfers involving pledged or third-party accounts, collateral to dealer loans and loans to others, and similar transactions. Thus the net settlements of the clearing balances at the end of each day will involve a broad cross section of the kinds of accounts maintained by any one participating bank.

Under the book-entry procedure these diverse types of accounts are not included among those that are eligible, and it is therefore not possible to settle the clearing account balances through book-entry accounts. However, once steps are taken to permit relatively unrestricted Government securities custody services to member banks on a book-entry basis, the way will be clear to permit a fully automated Government securities clearing arrangement. In lieu of physical settlements the Reserve Bank would merely credit or debit the respective book-entry accounts of the clearing banks with the par amounts of the Government securities issues owing to or owing from each

bank as a result of the netting process. To permit accurate accounting to their depositors, the member banks would be expected to maintain adequate internal records indicating the exact interest of each of their dealer or custody accounts in the net clearing settlements and in the resulting book-entry account balances. Normally, the clearing settlements would involve only one debit or credit entry for each affected securities issue in a bank's book-entry account, but in certain cases a limited number of subaccounts would be maintained for individual banks corresponding to the general categories of account (investment, trust, and so forth) on the books of the bank.

One area of expansion of the clearing arrangement that should be greatly assisted by the use of book-entry procedures relates to the movement of securities as collateral for overnight loans made by banks to nonbank dealers in Government securities. Normally negotiated well after midday, when the dealers have tallied up their total receipts and deliveries of securities and assessed their cash requirements, these loans call for the physical movement

of a large volume of Government securities, amounting in the aggregate to hundreds of millions of dollars, from the banks where the securities are lodged to the banks that are extending the loans. The labor involved in the counting, examining, and movement of this collateral causes delays that normally defer the delivery of the pledged securities to the lending banks until late in the afternoon. Under a combined book-entry and clearing procedure, these transfers could be effected simply by making entries in the affected accounts at the Reserve Bank and confirming them by appropriate teletype notification. The proceeds of the loan would be debited to the reserve account of the lending bank and credited to the borrowing dealer, through the reserve account of its clearing bank, at the same time that the securities are transferred in the book-entry accounts. All entries would then be reversed on the following day when the loan is liquidated. Such an arrangement, in addition to saving time, would also eliminate the risks inherent in the exposure of large dollar amounts of securities in the streets.

V. CLEARING AND BOOK-ENTRY APPLIED TO AGENCY SECURITIES

There has been a rapid growth during recent years in the volume of securities offered by the various agencies of the U.S. Government. The attractive rates on agency securities, which are virtually indistinguishable from Government securities from the standpoint of safety, have generated considerable interest on the part of all investor classes and have resulted in a steadily rising trading pace for such securities in the major financial markets.

With few exceptions, securities of agencies of the United States are issued and paid for through the Federal Reserve Bank of New York. Since most of these issues are not eligible for telegraphic transfer through the leased wire facilities of the Federal Reserve System,¹

purchasers located in other parts of the country are obligated to lodge their holdings with correspondents in New York City or to incur substantial costs incident to shipment to their own city.

In a number of instances, however, arrangements have been made whereby New York City subscribers to certain bearer issues of the Federal National Mortgage Association and the Export-Import Bank of the United States may transfer their allotments, through Federal Reserve System telegraphic facilities, to either the Chicago or the San Francisco Federal Reserve Bank, which will complete delivery from a supply of unissued stock maintained for that purpose. In addition, telegraphic transfers resulting from subsequent transactions in these securities may be effected among these three Reserve Banks by means of the same facilities.

¹Telegraphic transfer between Reserve Banks and branches is possible only where stocks of unissued securities are maintained at such banks in connection with the original issue and related fiscal services.

The further development and expansion of the securities clearing arrangement discussed in this paper must be extended, in time, to include obligations of agencies of the United States if the arrangement is to furnish complete service to the financial community. To the extent that these non-Government securities may become eligible for telegraphic transfer through Federal Reserve facilities, they must be among the issues represented in the clearings. In any event the anticipated expansion of the clearing arrangement may necessitate the use of this mechanism to simplify the local delivery of agency securities, whether or not these issues become eligible for telegraphic transfer among Federal Reserve cities. As noted earlier, any costs incurred by the Federal Reserve Bank of New York in providing an intracity clearing service—whether for Government or non-Government securities—would be absorbed by the participants in such an ar-

range rather than by the Treasury Department.

The establishment of book-entry custody arrangements at the Reserve Banks, applicable initially to Government securities owned by member banks and later to securities owned by the depositors and customers of these banks, will no doubt ultimately lead to the inclusion of securities of Government agencies as well. The resulting expansion of the clearing arrangement and the book-entry procedure to roughly twice the number of individual issues involved in each category at the present time should present no administrative problem in view of the immense recordkeeping capability of the sophisticated data processing equipment now available. Since the Reserve Banks have long been accepting the deposit for custody of all types of securities—including agency securities—from their member banks, no question of policy should arise in this connection.

VI. CONCLUSION

The years that have elapsed since the start of World War I have seen remarkable changes affecting almost every aspect of the economy. The myriad benefits of a computer-oriented society appear on all sides, and sophisticated labor- and time-saving devices have become commonplace in practically all areas of financial and industrial activity. Nevertheless, the streets of Manhattan and other financial centers throughout the country are still filled with hundreds of messengers making thousands of trips each day—delivering individual lots of securities back and forth among the banks and dealers that comprise the Government bond market—exactly as they did when the first offering of Liberty Loan Bonds was made five decades ago. The failure to complete any one delivery by the appointed time can cause the cancellation of security transactions involving millions of dollars, can result in unanticipated and unnecessary interest costs, and can create

operational problems that may affect a number of participants in these transactions.

It is essential to change these cumbersome delivery methods and to allow the traders in Government securities to function free of the limitations imposed by antiquated physical delivery methods. Since transactions in securities can now be finally consummated in seconds by means of teletype, and painfully slow individual deliveries can be replaced by end-of-day settlement on a book-entry basis, the means are at hand for radically improving the market mechanism. The savings in time and labor resulting from the elimination of most physical securities-handling tasks will also result in more economical operations on the part of all Government bond dealers, their clearing banks, the Treasury Department, and the Federal Reserve Bank of New York.

The combination of teletype delivery techniques, clearing procedures, and book-entry

arrangements—conducted with the aid of relatively unlimited computer-switching and data-storage capability—can broaden the scope of Government trading activities to a degree never before thought possible. Instantaneous completion of transactions, with immediate payment in Federal funds, will become commonplace and markets throughout the country will be as accessible as those across the street. Further, the need to issue, receive, deliver, or store physical securities will diminish in direct

proportion to the increase in the number of banks and other participants covered by the new arrangements. In a period when extreme time pressures, heavy workloads, and shortages of skilled manpower are crucial factors—and they will continue to be—in all securities operations, these new techniques offer the promise of solutions to many of the growing problems that are now faced by banks, dealers, and others involved in Government securities operations.





